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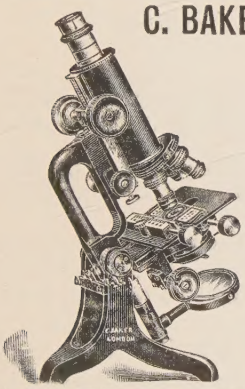

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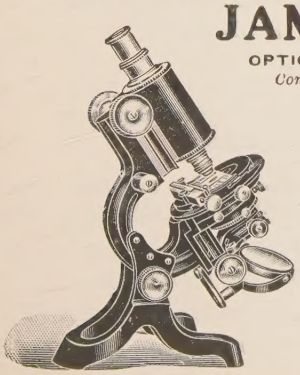

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January 24th, 1913.—Chemical, Biological and Clinical Study of GALYL, by Drs. DE BEURMANN (St. Louis Hospital) and TANON (communicated to the Société des Hopitaux de Paris).

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Studies on GALYL in Relapsing Fever, Noma, and Soft Chancre, by Dr. E. CONSEIL, Directeur of the Bureau d'Hygiene, Tunis.

The Intramuscular Injections of GALYL, by Dr. BALZER.

MEDICAL ANNUAL (1914).—Syphilis.

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

Vol. 6.] 1915. [No. 1.

TYPHUS.

CORBETT (C. H.). **Typhus Fever in Palestine 1913-14.**—*Brit. Med. Jl.* 1915. May 22. pp. 887–888.

The author describes the salient points of an epidemic of typhus in Palestine during 1913 and 1914. The epidemic broke out in the spring of 1913 and was extremely virulent; it first appeared in Jerusalem and later Hebron was swept with the disease. Towards the end of the year the number of cases diminished in the inland towns but increased in the coast towns, reaching the maximum in spring, 1914.

During this epidemic the author came to the following conclusions:—

The severity of the disease depends upon the age of the patient. Over twenty years of age the affection is much more severe, and is particularly dangerous over 30 or 35. The severity also depends upon the hygienic surroundings, for in the Jerusalem prison among about 180 patients there was a 50 per cent. death-rate, whilst in hospital cases the usual mortality is 20 per cent. The rash in typhus is reported not to extend on to the neck, but occasionally was observed to do so, though diffusely.

The infection seems to be transmitted by the body-louse and one patient became infected by unpicking a mattress which had been disinfected and exposed to the sun for some days. [In this case probably infected lice had survived and thus produced the infection.]

With regard to treatment good nursing is essential and a liberal supply of air-space, fresh air and, if possible, sunlight, are almost equally needed. Continuous sleeplessness must be combated with discretion and determination. Stimulants such as brandy and strychnine may be used during the days preceding the crisis, but digitalis is to be avoided. When pulmonary affections existed, injections of camphor were of great value. Injections of quinine and sodium sulpho-carbolate (the latter in 20 grain doses every four hours) undoubtedly modified the severity of the attacks.

The disease spread into Asia Minor in 1914, and crossing the Bosphorus reached Serbia and Austria.

E. Hindle.

MICHIE (Henry C.). **Mexican Typhus Fever.**—*Med. Record.* 1915. Feb. 6. Vol. 87. No. 6. pp. 214–218.

The author gives a summary of the present state of our knowledge concerning this disease and in addition adds notes on the biology and

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life-cycles of the three species of lice infesting man, and means of getting rid of them. Incidentally he mentions that the body-louse (*Pediculus vestimenti*) does not breed at high temperatures and as a result is absent in such towns as Vera Cruz.

With regard to treatment the author believes that sodium citrate in full doses, or the Sternberg yellow fever treatment, would be beneficial. The latter consists of sodium bicarbonate 150 grains, mercury perchloride $\frac{1}{3}$ grain, and two pints of water. Of this solution $1\frac{1}{2}$ ounce is taken every hour. The amount of water taken should be pushed to the limit, probably best in the form of lemonade, to increase the elimination of toxins.

Prophylaxis consists in avoiding being bitten by infected lice and various methods are suggested for preventing the spread of epidemics.

"1. Cleanliness of the body and linen.

"2. Avoidance of native shacks, washerwomen, and association with dirty people in infected zones.

"3. If infested, prompt and radical means for the extermination of the insects should be instituted.

"4. Thorough inspection of all cases in typhus localities, regardless of their condition before admission to hospital.

"5. Scrupulous cleanliness in hospitals, with frequent inspections to the end of preventing lice from gaining headway in the building.

"6. In case lice are found, all linen should be boiled, the wards fumigated with hydrocyanic acid or dioxide, and the heads and bodies of the patients examined.

"7. If it becomes necessary to enter infected places, the person should not touch the bed, sit down, or lay down his hat or coat; he should step quickly, roll up the bottoms of the trousers, and search his clothing for lice after leaving the building.

"8. When a typhus case is admitted to the hospital, the patient must be most carefully examined for lice before being admitted to the ward. He should be placed in a bed most positively free from lice, and as an additional precaution, covered with a mosquito bar tucked in around the mattress.

"9. Should typhus develop in a command, a thorough search for the louse should be instituted immediately, examining as many of the troops as necessary, especially those men who were in intimate contact with the patient. If thought advisable, the contacts should be quarantined in a pediculus free place during the incubation period.

"10. Entering buildings, wherever possible, in typhus bearing localities should be avoided. If buildings must be used, new ones should be selected. The number of cases would be greatly reduced, however, by using buildings as new as can be found, and by thoroughly renovating them before being occupied."

In conclusion the author asks whether typhus may not possibly exist in a chronic state in some lower animal, and be accidentally transmitted to man through the bite of the louse or some other insect.

E. H.

ANDERSON (John F.). **Typhus Fever. Its Etiology and the Methods of its Prevention.**—*U. S. Public Health Reps.* 1915. Apr. 30. Vol. 30. No. 18. pp. 1303–1311.

A useful summary of recent additions to our knowledge of typhus, in the course of which the writer mentions that the virus in the blood is deprived of infectivity by drying for 24 hours or heating to 55° C.

for five minutes. All efforts at prevention are centred on the louse and these efforts may be broadly grouped under the following headings :

"1. Measures for the reduction of lice infestation among the population in general.

"2. The destruction of all lice and their eggs found on the bodies, clothing, bedding, and surroundings of all cases of typhus, typhus suspects and contacts.

"3. The adoption of measures, by persons in the vicinity of cases of typhus, to reduce or prevent the possibility of their being bitten by lice.

"4. Inoculation with the mild type of the disease (Brill's disease) by persons contemplating entering localities where the disease is prevalent. Should Plotz's work [see this *Bulletin*, Vol. 4. p. 488] be confirmed the use of a vaccine prepared from the typhus-fever germ may be substituted for this."

E. H.

HORT (Edward C.). **Typhus Fever.**—*Brit. Med. Jl.* 1915. Apr. 17. pp. 673–675.

This paper consists of a short summary of the present state of our knowledge of this disease. In the course of the historical sketch the author mentions the appalling ravages of this disease in Serbia during the spring of 1915. On March 31st no fewer than 3,000 fresh cases were recorded from Skoplje alone. In that part of the article devoted to the method of spread of the disease the writer advances the view that typhus may be conveyed by the urine of convalescing and chronic typhus carriers, as well as by the agency of lice. No further evidence in support of this theory is brought forward beyond Hort and INGRAM's publication last year [see this *Bulletin*, Vol. 4, p. 489] and BURNS's observations on an outbreak of typhus in Eriskey [see this *Bulletin*, Vol. 2, p. 1].

[In view of the fact that NICOLLE and CONSEIL have clearly shown that in the absence of lice typhus does not spread, it may well be doubted whether it is necessary to guard against possible infection by urine and the evidence in support of the latter mode of infection is very uncertain.]

E. H.

THOINOT (L.). **Le Typhus exanthématique.**—*Ann. d'Hyg. Pub. et Méd. Legale.* 1915. Jan. Vol. 23. pp. 6–56. With 4 charts.

Although containing nothing original this article constitutes an excellent summary of the present state of our knowledge of this important disease, especially during the present war. The article should be read by all desiring a more complete knowledge of this malady, its history, diagnosis, method of transmission, etc., all being fully discussed.

E. H.

LINDNER (E.). **Zur Epidemiologie und Klinik des Flecktyphus.** [The Epidemiology and Symptoms of Typhus.]—*Wien. Klin. Woch.* 1915. Mar. 25. Vol. 28. No. 12. pp. 315–316.

The establishment of camps for prisoners of war in Austria has been followed by the appearance of typhus, and the author adds some notes on the disease. In one camp of about 9,000 Russians, there were over 300 cases of typhus in less than a week and a number of the attendants contracted the disease.

The disease seems to be more fatal to these attendants, etc. (Germans and Hungarians) than to the Russians, for out of 54 of the former who contracted the disease 13 died, a mortality of 24 per cent. On the other hand in the above mentioned camp of Russians, although there were so many cases of typhus, there was not a single death.

The author then proceeds to discuss the reason for this difference in mortality. One reason may be the fact that typhus is more widespread in Russia than in Austria, and in any population the rarer the disease the higher is its mortality. Another possibility is that the prisoners who have been bitten for weeks, sometimes for months, by large numbers of lice acquire the virus in an earlier form, when its virulence is very slight, and thereby develop a relative immunity against the disease.

The possibility that the different races are differently affected seems very improbable in the present case and the author considers that the true explanation lies in one or both of the above mentioned theories.

E. H.

PALTAUF (Rich.). **Ueber das Vorkommen von Influenza bei Flecktyphus.** [The Appearance of Influenza with Typhus.]—*Wien. Klin. Woch.* 1915. Mar. 11. Vol. 28. No. 10. pp. 261–262.

The author in two days examined the bodies of six patients who had died of typhus in one of the prisoner-of-war camps. In all these cases signs of acute bronchitis were found in the lungs and microscopic examination showed the presence of the influenza bacillus. Cultures were made from four of these patients and the influenza bacillus isolated in order to confirm the microscopic examination.

The author then mentions that in many of the camps influenza precedes the development of typhus and that when the two occur together the patient usually succumbs. The frequent association of the two may partially explain the common idea amongst some of the older physicians that typhus may be carried in the air, although there is no evidence in support of this belief.

In conclusion the author points out that the use of masks is quite unnecessary, as the result of the Balkan war clearly demonstrated that in the absence of lice typhus does not spread and therefore it is only necessary to guard against the possibility of being bitten by these parasites.

E. H.

BURNS (Wm. C.). **Typhus Fever.** [Correspondence].—*Brit. Med. Jl.* 1915. May 1. pp. 784–785.

The writer refers to his previous article [see this *Bulletin*, Vol. 2, p. 1] and calls attention to an outbreak of typhus fever that occurred in an isolated district in Skye. This was reported on by Dr. DEWER, who traced the outbreak to a man who had been engaged in stripping the thatch from the roof of his cottage. He had lived in the house for years but several cases of typhus had occurred previous to his occupancy and it was thought that the infective agency had persisted in the thatch. The writer suggests that the bronchial secretion, often profuse, may contain the infection and, forcibly expelled by coughing, have lodged in the exposed thatch of the low cottage roof.

[From what is known of the nature of typhus, there is no evidence to support the view that the virus can exist for any length of time either in the air, in the thatch, among excreta, or in similar localities. All experimental evidence points to the fact that typhus is transmitted solely by the agency of lice, and it has been shown that in the absence of these parasites the disease does not spread. The above writer mentions that lice were greatly in evidence in his cases of typhus and it seems probable that the outbreak was the result of one of the patients coming in contact with a person either suffering from a mild form of the disease or harbouring infected lice.]

E. H.

KLEMPERER (G.) & ZINN (W.). **Zur Diagnose und Prophylaxe des Fleckfiebers.** [The Diagnosis and Prophylaxis of Typhus.]—*Therapie d. Gegenwart.* 1915. Feb. Vol. 56. No. 2. pp. 41–45.

The author describes in detail the history of the case of Dr. George JOCHMANN, who became infected with typhus in December, 1914, and died the same month. JOCHMANN himself believed that typhus could be transmitted from one person to another without the presence of any lice or other carrier, and in his own case was of the opinion that the infection had been direct. The author points out the probability of lice being responsible for the infection in this, and all other cases, and concludes with notes on methods of destroying lice. As a prophylactic agent against infection with lice, he recommends rubbing oneself with a 15 per cent. alcoholic solution of anisol. In addition naphthalene is a very efficient repellant [see below, p. 11].

E. H.

WEIL (E.) & SPAET (W.). **Die Bedeutung der Widalschen Reaktion für die Diagnose des Flecktyphus.** [The Importance of the Widal Reaction in the Diagnosis of Typhus.]—*Wien. Klin. Woch.* 1915. Feb. 25. Vol. 28. No. 8. pp. 207–208.

The author mentions three cases which presented all the features of typhus such as the typical exanthem, etc., and yet the blood of each patient gave a positive Widal reaction with the typhoid bacillus and a negative reaction with paratyphoid. The blood and faeces of each patient were then examined for the presence of the typhoid bacillus, although from the clinical symptoms the physician, who was familiar with typhus, had no doubt that they were suffering from this disease. In one of the patients the first three bacteriological examinations of the blood were negative, but the typhoid bacillus was obtained in the fourth attempt. This patient died and was found to have been suffering from unmistakable typhoid fever. Similar results were obtained with the other patients and the author calls attention to the difficulty of distinguishing certain cases of typhoid from typhus and in all doubtful cases recommends the employment of the Widal reaction.

E. H.

CAMERON (James). **Typhus Fever.** [Correspondence].—*Brit. Med. Jl.* 1915. May 1. p. 785.

The writer calls attention to the fact that very shortly after Widal's reaction for typhoid was published he examined the sera of a number of typhus patients, during an epidemic in West Lothian, and several gave the Widal reaction.

These observations were published in the now defunct *Scottish Medical and Surgical Journal*, and at the time seemed to throw doubt on the specificity of Widal's reaction. They have since been confirmed by WILSON.

E. H.

HORT (Edward C.). **Typhus Fever.** [Correspondence].—*Brit. Med. Jl.* 1915. May 8. p. 826.

The author calls attention to the fact that CAMERON was the first to show that *B. typhosus* is sometimes emulsified by the serum of typhus patients. He then proceeds to refer to BURNS's observations [see above, p. 4] and suggests that facilities for the disinfection of excreta and sputum should be provided in all cases of typhus as precautions, in addition to the essential warfare against lice.

E. H.

MAXWELL (Ernest J.). **Open-Air Treatment of Typhus Fever.** [Correspondence].—*Brit. Med. Jl.* 1915. Mar. 20. p. 528.

The writer mentions that in Tripoli city during the war the Italians treated cases of typhus mostly in huts or special tents. This method seems to be much better than using ordinary wards, as a tent or a hut can be more easily cleared of vermin ; besides there is better ventilation and a free current of air is supposed to be a great safeguard. At the North Africa Mission Hospital in Tangier they lost on two occasions both the doctor and the nurse through admitting a typhus case to the ward.

The writer advises, therefore, that typhus cases should be treated in tents and, if that is not possible on account of the weather, in special huts which could be destroyed afterwards.

E. H.

HEAD (George Douglas). **A Case of Typhus Fever.**—*Jl. Amer. Med. Assoc.* 1915. Mar. 20. Vol. 64. No. 12. p. 991. With 1 chart.

The author records a case of typhus fever occurring in May, 1914, in a male patient 50 years old, living at Minneapolis, Minn. This is the first case recorded from Minnesota.

E. H.

UMBER (F.). **Flecktyphusartiger Verlauf von Genickstarre.** [Cerebro-spinal Meningitis resembling Typhus.]—*Med. Klinik.* 1915. Feb. 14. Vol. 11. No. 7. pp. 187–188.

The description of a case which was diagnosed as typhus, but after death was found to have been a case of cerebro-spinal meningitis. The early symptoms of the patient closely resembled those of typhus and the hospital officials had no doubt as to the correctness of this diagnosis until the post mortem revealed the true nature of the disease.

E. H.

NICOLLE (Charles), BLANC (G.) & CONSEIL (E.). **Quelques points de l'etude expérimentale du Typhus exanthématique.** [Correspondence].—*C. R. Acad. Sci.* 1914. Nov. 9. Vol. 159. No. 19. pp. 661–664.

The authors have conducted further experiments on typhus with the object of clearing up some of the obscure points concerning its etiology and transmission. In order to determine the exact incubation period after which lice fed on infected blood become infective, a number of these insects that had been fed on an infected monkey were ground up at intervals of one to ten days and injected into monkeys and guinea-pigs. Out of 11 experiments 8 (6 monkeys, 2 guinea-pigs) inoculated with lice one to seven days after the infected feed all gave negative results, whilst 5 animals (4 monkeys, 1 guinea-pig) inoculated nine to ten days after the infected meal all became infected with typhus.

These results show that lice are not infective before the eighth day, but are constantly infective on the ninth or tenth days.

Similar experiments were performed with the faeces of lice that had fed on a typhus patient. The results show that the faeces of such lice become infective after an incubation period of nine to ten days, and therefore the excrement of these insects may serve as a source of infection in addition to their bites.

Two experiments were made in order to test the possibility of hereditary infection in the louse but both gave negative results, and the authors suggest that the one positive result obtained by Edm. SERGENT and his collaborators might be explained by the possibility of the eggs being contaminated by faeces from infected lice, or even by the blood from the patient.

The coccobacilli described by Edm. SERGENT and his collaborators, as occurring in the intestine of lice fed on typhus patients, was found in 5 per cent. of lice collected in districts in which typhus did not occur.

Two attempts to filter the virus obtained by grounding up 140 and 175 infected lice respectively both gave uncertain results and therefore the filtrability of the causative agent of this disease cannot be regarded as certain.

In conclusion the authors state that guinea-pigs are quite as susceptible to typhus as monkeys and the virus maintained its virulence after passage through twelve guinea-pigs. These animals can be made less resistant to the disease by mixing the virus with some heterogenous serum (e.g., eel or lizard).

In the blood and organs of infected guinea-pigs not any organism could be detected.

E. H.

NICOLLE (Charles), BLANC (Georges) & CONSEIL (E.). **Nouvelles Recherches expérimentales sur le Typhus exanthématique pratiquées à l'Institut Pasteur de Tunis pendant l'Année 1914.**—*Arch. Inst. Pasteur de Tunis.* 1914. Dec. 1. Vol. 9. No. 2. pp. 84–121. With 17 charts.

The greater part of this article is merely a more detailed account of the results previously published in the *Comptes Rendus de l'Académie des Sciences* which are reviewed above. In addition it is stated that the spleen of infected animals is virulent but not in any greater degree than the blood.

The authors find that a previous attack of spirochaetosis sometimes protects monkeys against a subsequent inoculation of typhus, for out of eleven monkeys that had recovered from relapsing fever and were then inoculated with the virus of typhus, two did not become infected and one showed a slight rise in temperature after an abnormally long incubation period; the remaining eight all became infected with typhus after the usual incubation period. This resistance may perhaps be due to the action of the blood elements introduced into the circulation when the animals were inoculated with the spirochaetes.

Further attempts to infect rabbits, dogs and cats with typhus gave entirely negative results.

E. H.

NICOLLE (Charles). **Quelques points concernant le typhus exanthématique.**—*Bull. Soc. Path. Exot.* 1915. Apr. Vol. 8. No. 4. pp. 160–161.

During the year 1914 not a single case of typhus has been contracted within the town of Tunis although three were imported, one from Algeria and two from Morocco.

The virus of this disease has been kept going in the laboratory from May and June 1914, up to the date of the communication (March 10th, 1915). The first virus obtained in May has had the following passages: monkey, guinea-pig, monkey, lice, monkey, lice, monkey, lice, monkey, sixteen successive guinea-pigs, monkey, guinea-pig.

The second virus, obtained in June, was first passed through a monkey, then successively through twenty-two guinea-pigs. At the sixteenth and at the twenty-second passage, the blood was shown to be virulent for monkeys.

In order to keep the virus in the laboratory it is advisable to use only adult guinea-pigs and to inoculate two or three at each passage, and to take the temperature carefully every morning and evening. The temperature curve is the only sign of infection in this animal. Successive passages through the guinea-pig do not seem to increase the activity of the virus towards the guinea-pig itself, but seem to increase its virulence for monkeys. Four years ago the author showed that the inoculation of serum from an infected animal during the febrile period is harmless in small doses for man. In addition the following experiment was made:—0·5 cc. of the serum of an infected guinea-pig collected during the febrile period, centrifuged and kept for a short time in the ice-chamber, was inoculated subcutaneously into a man. Ten days later a second inoculation of 1 cc. serum was administered. Ten days later a third inoculation of 1 cc., but this time the serum was shaken so that it contained blood cells. These three inoculations produced no trouble and ten days after the last the patient was inoculated with 3 cc. of blood from an infected guinea-pig. Although under observation forty days no febrile symptoms were noticed.

It seems possible therefore that repeated inoculations of small doses of the virus are capable of producing immunity against typhus, and might perhaps be used as a preventive vaccination against this disease.

E. H.

GHON (A.). **Ueber die neuen diagnostischen Helfsmittel bei Flecktyphus.** [On New Aids in the Diagnosis of Typhus.]—*Prager Med. Woch.* 1915. Jan. 7. Vol. 40. No. 1. pp. 5–7.

The author reviews recent literature on this subject and calls especial attention to two new aids in the diagnosis of typhus, viz:—the examination of the blood and the histological character of the exanthem. The presence of diplo-forms in the leucocytes and certain peculiarities in the staining reactions of these cells after vital staining with Azur II are said to be characteristic of typhus, as shown by PROWAZEK [see this *Bulletin*, Vol. 2, p. 640]. Moreover, FRAENKEL has shown that the histological character of the typical exanthem is peculiar to typhus [see this *Bulletin*, Vol. 3, p. 564].

The paper contains nothing original. E. H.

GHON (A.). **Einige von den Erfahrungen über diagnostischen Helfsmittel bei Flecktyphus.** [Some Observations on the Aids in the Diagnosis of Typhus.]—*Prager Med. Woch.* 1915. Feb. 25. Vol. 40. No. 3. p. 82.

The author refers to the two methods recommended in his previous paper [see above], and as a result of further experience states that the cytological and bacteriological or serological examination of the blood are the only diagnostic aids of any value. Leucocytosis combined with degenerative alterations in the leucocytes and negative bacteriological and serological examinations is characteristic of typhus, as the author has found from examining several cases of this disease. For the bacteriological examination of the blood it is essential that it should be collected aseptically and that good films should be made, as badly prepared films are worthless. E. H.

ANDERSON (John F.). **Laboratory Methods in the Diagnosis of Typhus Fever.**—*Amer. Jl. Pub. Health.* 1915. May. Vol. 5. No. 5. pp. 456–457.

A very brief summary of methods of use in the diagnosis of typhus. They may be divided into those of value (*a*) because of negative findings and (*b*) because of positive findings.

(*a*) "Of special value are a positive Widal reaction [but see above p. 6], positive blood or feces cultures showing the presence of organisms of the typhoid group, or positive cultural and microscopic findings from the fluid obtained by spinal puncture. Should any of the above findings be obtained, typhus fever may be excluded and for that reason such studies should be made when it is not possible to carry out the procedures to be discussed under (*b*)."

(*b*) Either guinea-pigs or monkeys are inoculated with blood and blood cultures from the patient. It is sufficient to inoculate two guinea-pigs of about 500 gm. weight with 3 to 4 cc. of defibrinated blood taken from the patient during the febrile period. The rectal temperature of the animals should be taken twice daily and the temperature plotted on a chart. Observations should be continued for at least three weeks.

If PLOTZ's results should be confirmed this will be a most valuable laboratory method, comparable with that of blood cultures in typhoid fever. E. H.

MENSE (C.). **Zur Frage der Bekämpfung des Fleckfiebers und der Läuse.** [The Problem of combating Typhus and the Louse.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1915. Mar. Vol. 19. No. 6. pp. 172–176.

After mentioning the fact that typhus is transmitted by the agency of lice the writer proceeds to discuss various methods of destroying these insects.

It is obvious that great care must be taken to free from lice the clothes and linen of all typhus patients. One method is to disinfect the whole room containing the clothes with sulphur dioxide and it is best to employ cylinders of the gas, which can be bought quite cheaply. It is necessary to produce a concentration of 6 to 8 per cent. in order to disinfect a room and, in order to kill all lice, an exposure of at least four hours is essential. Salfarkose, a patent preparation, can be used instead of SO_2. Patients who are infested with head and body lice should be shaved naked and rubbed all over with grey ointment.

Aetherial oils are efficient louse repellants and it is suggested that medical attendants and others should use Senfol, anisol, or even naphthalene to prevent infection.

With regard to fumigation it is pointed out that KISSKALT found that exposure to steam for five minutes killed all lice, whilst sulphur dioxide required 24 hours. Moreover dry heat at 70° C. kills all lice and their eggs in ten minutes. On the other hand an exposure to –5° C. does not kill either the lice or their eggs.

A 5 per cent. mixture of naphthalene with vaseline, and also benzine and ether are toxic agents. A mixture of bergamot oil (15 per cent.) in alcohol, is also a very efficient agent against lice and fleas.

Finally the author mentions a lotion which he has found most effective against all three varieties of lice in the egg and all stages of development—one part of mercuric chloride and 299 parts of Acetum vini which, if necessary, can easily be prepared from ordinary sublimate tabloids and vinegar. This mixture should be rubbed into the hair and over the skin of infected persons. It is sometimes liable to produce inflammation of the skin, in which case an ointment, such as 10 per cent. salicylic vaseline, should be used after the above.

This lotion is much more effective than grey ointment, as the latter does not kill the eggs of the lice.

E. H.

LAVERAN (A.). **Au Sujet de la Prophylaxie du Typhus dans les Armées en Campagne.**—*C. R. Acad. Sci.* 1914. Nov. 9. Vol. 159. No. 19. pp. 640–641.

The author calls attention to the part played by lice in the transmission of typhus, and in view of the possibility of this disease being introduced amongst the soldiers at the front, insists upon the necessity of combating any outbreaks of phthiriasis that may occur among the men.

E. H.

BLASCHKO (A.). **Zur Prophylaxe des Flecktyphus.**—*Deut. Med. Woch.* 1915. Jan. Vol. 41. No. 1. p. 12.

The prophylaxis of typhus can only be effected by preventing pediculosis, and therefore any means of effectively destroying both body and head lice will arrest typhus epidemics.

The author calls attention to the fact that naphthalene is a very efficient agent against body-lice, either in the form of a 5 per cent. mixture with vaseline, or in the powder. All soldiers should be provided with about 30 to 50 gms. of powdered naphthalene and when any itching due to lice is noticed the parts affected should be well rubbed with naphthalene mixed with vaseline. In addition about half a tea spoonful of the powder should be scattered round the neck at the top of the shirt or better still two bags of the powder can be tied round the neck in order to prevent any of the lice passing from the body to the head. A little of the powder scattered in the bed also prevents the body lice living in this locality.

With regard to the head lice, the best method of preventing their occurrence is to insist upon the hair being closely cut with the machine.

[The efficacy of this simple remedy should make it extremely useful at the front in preventing the spread of any pediculosis.]

E. H.

NICOLLE (Charles) & CONSEIL (E.). **Nécessité des Mésures à prendre pour préserver nos Armées en Campagne des Typhus Exanthématique et Récurrent.**—*Presse Méd.* 1915. Jan. 21. No. 3. pp. 18–19.

The authors call attention to the importance of protecting the soldiers from being infested with lice, as both typhus and relapsing fever are transmitted solely by the agency of these parasites. In Tunis typhus has been practically exterminated by preventing the spread of the disease, this being effected solely by combating the lice which transmit the infection. Thus in 1909 there were 856 cases; 1910, 148; 1911, 180; 1912, 22; 1913, 6; and in 1914 only three cases, all of which were imported. These results show what can be accomplished in the case of typhus, and it is to be hoped that by adopting preventive measures against lice, epidemics may be prevented in the Allies' armies.

E. H.

FRISCH (Johann). **Zur Verhütung der Infektion mit Flecktyphus.** [On the Prevention of Infection with Typhus.]—*Wien. Klin. Woch.* 1915. Apr. 8. Vol. 28. No. 14. pp. 367–368.

The writer strongly urges the importance of fresh air in cases of typhus and recommends that the windows and doors should be left wide open in all typhus wards or rooms containing cases. In addition he asserts his belief in the old theory that typhus may be spread by breathing the air in badly ventilated typhus wards, but no evidence is brought forward in support of this statement.

E. H.

KRAUS (R.) **Zur Frage der persönlichen Prophylaxe gegen Typhus exanthematicus.** [The Problem of Personal Prophylaxis against Typhus.]—*Wien. Klin. Woch.* 1915. Mar. 25. Vol. 28. No. 12. pp. 314–315.

The author advances the opinion that typhus may be contracted by breathing the air of infected patients and advocates for doctors and nurses in typhus hospitals the use of masks similar to those used during the plague epidemic in Manchuria.

E. H.

TYPHOID AND PARATYPHOID IN THE TROPICS.

GREIG (E. D. W.). **Enteric Fever in India.**—*Proc. Second All-India Sanitary Conference held at Madras November 11th to 16th, 1912.* Vol. 3. Research. pp. 312–315. 1913. Simla: Government Central Branch Press.

In the years 1906–1908 Major Greig and his colleagues in the Indian Medical Service carried out on behalf of the Government of India an enquiry into the causes of enteric fever among the troops in India, and their results included the well-known investigation into the problem of the typhoid carrier and the clear distinction between typhoid and paratyphoid fevers. On their recommendation the Government established two depots, one at Naini Tal and the other at Wellington, for the segregation and investigation of enteric convalescents. In this paper Greig collects some of the opinions already published by others on the influence which the two depots have exerted on the prevalence of the disease in the Indian army. This is necessarily difficult to estimate with any degree of accuracy. Enteric had undoubtedly been diminishing before they were established. Colonel FIRTH for example gives the number of paratyphoid and typhoid cases in 1897 as 2,050 and in 1907 as 1,012, and antityphoid vaccination has certainly contributed to the fact that for 1910 and 1911 the figures according to FIRTH are 335 and 274. But there can be no doubt that the segregation of the temporary carrier as well as the chronic carrier must have effected a real and increasingly important reduction in the exposure to infection. On this there is general agreement among Indian military medical authorities, and the collection of carriers into these depots affords an opportunity of study all the more valuable in that it is not at present available in civilian practice.

J. Henderson Smith.

CLARK (Francis). **Twenty Years of Enteric Fever in Hongkong.**—*Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal, Saigon (1913).* 1914. pp. 185–194.

The population in such a town as Hongkong is fluctuating and difficult to assess in the intercensal periods, but approximately from 1898–1912 there were 10,000 Europeans and Americans, 300,000 Chinese, and 8,000 other Asiatics annually present. The incidence and mortality per 1,000 of enteric fever on these classes of the population in quinquennial periods was as follows :—

	Europeans and Americans.		Chinese.		Other Asiatics.	
	Case-Rate.	Deaths.	Case-Rate.	Deaths.	Case-Rate.	Deaths.
1898–1902	3·64	0·86	0·08	0·07	1·02	0·58
–1907	4·27	1·09	0·07	0·06	1·53	0·15
–1912	2·70	0·48	0·13	0·09	1·34	0·22
1898–1912	3·52	0·80	0·08	0·07	1·30	0·30

The average case-mortality among Europeans for the 15 years was 22·8 per cent.; among Chinese 78·5 per cent. (steadily falling from 87·8 per cent. in the first period to 71·4 per cent. in the third owing to the establishment of many hospitals and dispensaries), and among other Asiatics 23·4 per cent.

The risk of infection amongst whites is shewn to be about eight times as great as it is in Surrey, England, and the chance of recovery slightly less. The difference in the incidence on whites and Chinese is very remarkable. No doubt many cases amongst the Chinese go unrecognised, but Clark believes that during the 10 years from 1903 not many deaths can have escaped recognition, and the death-rate for that period was 0·076 per cent. amongst the Chinese as against 0·78 per cent. in whites. It has been suggested that the low incidence is due to unrecognised attacks in childhood conferring immunity and it appears that a high proportion of all Chinese deaths from enteric occur in children under 5 years, e.g. in 1900, 5 out of 39; in 1904, 32 out of 55; in 1912, 43 out of 88. But typhoid accounts for only a very small proportion of the total deaths under 5 years, too small to support a theory of general typhoid infection in infancy, unless it is of improbably low virulence. The prevalence of dysentery makes different diet and habits of feeding an unlikely explanation, and there is no real support for the alleged difference in the lymphatic development or unusual prevalence of lactic acid bacilli in the gut of the Chinese. Clark is inclined to accept the view that there is a natural or racial immunity to the disease. He finds no definite climatic or seasonal prevalence [but the numbers are perhaps too small to bring out the point clearly.]

Infection is, he thinks, chiefly due to eating raw fruit or vegetables. The Chinese system of obtaining manure is to fill a pit with water, to which he adds human faeces and urine, and the highly nitrogenous supernatant fluid, which must always contain some recent excrement, is used to spray his vegetable and fruit garden. The only safe rule for Europeans is to avoid all raw vegetables and ground fruit, e.g. strawberries.

In discussion Dr. Chastany remarked that at Shanghai much of the prevalent low fever is probably typhoid, and that there is some reason for believing that persons vaccinated against typhoid escaped.

J. H. S.

Gutierrez (Perpetuo). **Typhoid Fever in the Philippines.**—*Philippine Jl. of Sci.* Sect. B. Trop. Med. 1914. Aug. Vol. 9. No. 4. pp. 367–378.

A clinical study of 125 cases of Filipinos treated in the Philippine General Hospital at Manila, and of interest as a comparison of the disease in the tropics with the better known picture of temperate climes. Judging by the hospital records the disease has increased of recent years, and the admissions show the usual seasonal maximum in September November, the usual preponderance in males, and the usual maximal incidence, in both sexes between the ages of 15 and 25. In Oriental countries such as India, there is recorded an unusually high incidence in children (e.g., Rogers in Calcutta, 41·6 per cent. of cases were under 15) but in the present series less than 10 per cent. were found under 15 years and Nicholas has already recorded a similar

figure for the Philippines. The clinical picture is on the whole the familiar one. The classical temperature curve is rarely met with; it does not go so high and the fastigium is not so prolonged. Only one case reached 41° C., and only 43·4 per cent reached 40°, and a noticeable feature was the frequency of remissions. In nearly 10 per cent. the curve was wholly irregular; recrudescence occurred in 4·3 per cent., and relapse in 8 per cent. of the cases. Abortive cases, lasting only 15 days at most, formed 13·8 per cent. These were generally mild, and in ordinary practice would probably have escaped recognition. In such cases the following points should be borne in mind. Headache at the outset is usually a pronounced symptom, sometimes intense, but more commonly a dull ache at the vertex; the pulse rate is slow—80–90—considering the fever (39° F. or so); the spleen is enlarged to percussion, and the typhoid tongue is fairly constant. In the whole series constipation was more frequently present than not, continued diarrhoea occurring only in 9 cases, and transient diarrhoea in 21. Haemorrhage and perforation were commoner than usual. The mortality was high. Excluding 10 cases which were hopeless from the time of admission, death occurred in over 13 per cent. of the cases—a rate which, while not so high as some of those recorded in other tropical countries, may perhaps be due to the generally poor conditions of life among the Filipinos. Blood-cultures were positive in 8 out of 13 made before the 6th day, and in 12 out of 32 made after the 6th day.

J. H. S.

WILLETS (David G.). **Widal Reactions among Healthy Adult Filipinos.** —*Philippine Jl. of Sci.* Sect. B. Trop. Med. 1914. June. Vol. 9. No. 3. pp. 253-257.

Willets found 4 per cent. of young adult, apparently healthy, Filipinos to give a definite positive Widal reaction, and 16·1 per cent. to give a distinct agglutination reaction not strong enough to be called fully positive—these figures being based on the examination of 300 individuals. In 1911 CHAMBERLAIN found only 2·9 per cent. positive in 307, and Willets is inclined to connect the increase in the percentage with the increasing prevalence of typhoid in the Philippines.

J. H. S.

BERNARD. **La Fièvre typhoïde au Maroc Occidental en 1911.**—*Arch. de Méd. et de Pharm. Milit.* 1914. Jan. Vol. 63. No. 1. pp. 1–56. With 2 figs.

This is an account, written by a medical officer who accompanied the troops, of the epidemic in the French expeditionary force of 1911. It is a melancholy record, of particular value to military authorities, as a modern instance of the havoc typhoid can produce when sanitary measures for whatever reason are insufficiently enforced. So far as concerned the country in which the operations took place there was no reason to anticipate any severe outbreak. Typhoid was already present in stations like Casablanca and Chaouia, but the route through which the columns had to march lay largely through desert where the hot dry sand rapidly destroys dangerous contamination, and was supplied with good pure water, and in spite of the dust and flies strict sanitary supervision might have kept under control any outbreak of

the disease. Yet of the troops disembarked in Morocco at least one-tenth were struck down by undoubted typhoid, and of these 16·1 per cent. died. Accurate figures of the incidence of the disease cannot be obtained. The total given (2,471 in all) is almost certainly too small. It includes only undoubted cases treated as such. Many mild cases, especially in the earlier days of the epidemic, were returned as febrile gastric disturbance, paludism and the like, and very many probably escaped recognition at all with, as one result, a raising of the apparent mortality rate. In this, as has been noted in other campaigns, ambulatory cases were numerous, some ending with dramatic suddenness, but many returning to the ranks after a short period of slight sickness, and many probably never fell out at all.

The arriving troops brought the disease with them, and apparently each unit supplied its own infective focus. There was no real reason to suppose that there were local sources infecting the detachments of troops in succession as they came into occupation. Rather the whole column was infected and carried its disease with it in every part, and from one stage of the route to the next. Every circumstance favoured its spread. The military requirements demanded haste; the country was new and hostile, and it proved impossible to take in advance the measures desirable to maintain the purity of the water for arriving troops, or to prevent them drinking water unboiled or unfiltered. There was ample provision of filters, but baggage was frequently delayed, the men would not wait for the slow process of providing pure water at every halt, and often there was no material for fires to boil. Bernard's impression, however, is that the disease was spread mainly from man to man, and that water contamination played only a minor part. Dust and the incessant plague of flies must have had some share in dissemination, especially as the system of disposal of excrement appears to have been extremely faulty, at least in practice. There was, however, undoubtedly a large number of cases constantly excreting typhoid bacilli for weeks, unrecognised or only recognised late in their attack, and the close contact of camp life under conditions where personal cleanliness was habitually and often necessarily impossible gave every chance for direct spread within a unit, while the military arrangements produce a continual intercourse of one unit with another which enlarged the field of contact for any single infected individual.

The epidemic began towards the end of May, soon after the troops began to disembark, reached its height on the line of march in July (in Casablanca not till two months later), and died out quickly thereafter in the original troops, though reinforcements as they came continued to be attacked. The native troops were almost exempt, the white troops alone suffering severely. Bernard gives an instance of one battalion numbering 835 men in May, which by August 25th contained only 302, of whom not more than 214 were fit for active service. The so-called "Colonial" troops (white) suffered most heavily, possibly, suggests Bernard, because of the less stamina of men drawn from town life and unhealthy surroundings in youth. They, like the others, had not been vaccinated, and we may hope that this expeditionary force of 1911 will be the last occasion on which typhoid will play its formerly invariable part in military campaigns. The similar expedition of 1912 with vaccinated troops had no such epidemic, except in one unvaccinated division.

J. H. S.

DUDLEY (Sheldon F.). **Note on a Typhoid Carrier.**—*Jl. R. Naval Med. Service.* 1915. Jan. Vol. 1. No. 1. pp. 63–65.

An account of a ship's cooper, brought by his occupation into contact with food, who had enteric fever in 1898 and was recognised as a carrier in 1914. During this period cases, which together make up a total of 53, occurred in every ship to which he was sent while he was on board, even when the rest of the fleet was practically free from enteric—e.g., in the "Implacable" six cases occurred in 1909 during his stay on the ship, at a time when there were only two cases in the rest of the Atlantic fleet amongst some 9,000 men. He was finally discovered after 28 cases had occurred in the "Formidable," which could not be accounted for in any other way. He gave a positive Widal test, the urine was sterile, and the bacillus appeared only intermittently in his faeces.

J. H. S.

GOODWIN (W. R. P.). **A Case of Paratyphoid Fever "A" with Relapse.**—*Jl. R. Army Med. Corps.* 1914. Aug. Vol. 23. No. 2. pp. 205–207. With 2 charts.

A case of interest as showing a typical relapse after 14 days of convalescence, the blood giving positive cultural reactions, in the occurrence of a roseolar eruption during the relapse, and in the absence of tonsillitis and tenderness over the region of the gall-bladder, and the absence of enlargement of the spleen. It is noteworthy that the organism isolated during the relapse, though apparently giving the sugar reactions of B. paratyphosus A (this is not directly stated), was agglutinated by specific serum in dilution of 1 in 10, and not at all with typhoid serum, suggesting a possible variation in the organism.

J. H. S.

CASTELLANI (Aldo). **Brief Note on a Case of Triple Infection: Typhoid, Paratyphoid 'A", and Paratyphoid "B".**—*Jl. Trop. Med. & Hyg.* 1915 Feb. 15. Vol. 18. No. 4 pp. 37–38. With 2 charts.

Record of a case in which all three organisms were isolated from one sample of faeces, and on two other examinations, as also on two examinations of urine, both B. typhosus and B. paratyphosus A were obtained. The patient's serum agglutinated all three organisms. Cases of double infection have been recorded several times, but this is apparently the first of triple infection.

J. H. S.

BOURKE (E. A.), EVANS (Idris D.) & ROWLAND (Sydney).—**Preliminary Observations on the Use of an Autogenous Living Vaccine in the Treatment of Enteric Fever (Six Cases).**—*Jl. R. Army Med. Corps.* 1915. Jan. Vol. 24. No. 1. pp. 5–12. With 6 charts.

The writers have treated five cases of typhoid and one of paratyphoid B infection with living autogenous vaccine, not only without ill results but with apparently excellent benefit. In each case a 5 cc. sample of blood was added to 1 per cent. sodium taurocholate and incubated;

from this a broth culture was prepared and the organism identified, and then a fresh broth culture was made, counted and used direct subcutaneously as the vaccine. The initial dose given was 60 million of the paratyphoid B, and from 100–200 million of the B. typhosus. Three or four doses were given, rising in one case to 300 millions. Local reaction was less than that usually obtained after prophylactic injection, the general reaction was marked and might be accompanied by profuse perspiration.

J. H. S.

MACARTHUR (W. P.). **Note sur soixante trois cas successifs de Fièvre Typhoïde traités par le Vaccin.**—*Bull. Soc. Méd. de l'Ile Maurice.* 1914. Apr.-May-June. Vol. 32. 2e Sér. No. 36. pp. 31–34.

The patients dealt with here were mostly brought to Macarthur as cases of doubtful fever, and his procedure was to make a blood culture, and also at once inject a stock typhoid vaccine if typhoid was a possibility, and then go on to autogenous vaccine if the culture was positive. The organism was recovered 58 times from the blood (in two cases it was not isolated at all, and in three only from the faeces), and out of 14 attempts between the 14th and 24th days of the disease it was got 12 times, a rather unusually long duration of septicaemia. No ill effects in any case were observed. On the other hand the benefit in early cases was striking. The severity of the attack was undoubtedly diminished, not so much by reduction of the fever (though sometimes there was a regularly marked drop after each injection), as in the absence of headache, lumbar or abdominal pains, and the other disturbing accompaniments of the usual disease. The effects were much less marked in cases in which the treatment by vaccine was not begun till after the 14th day of the disease. These numbered 11 cases, and all the complications and relapses, of which there were two, observed in the whole series, occurred in this group with the exception of one fatal broncho-pneumonia. The total mortality was 3·1 per cent. The doses given began with 150–300 millions and were increased every two or three days, till in one case as many as 1,500 millions were given.

J. H. S.

ICHIKAWA (Sadakichi). **The Abortive Treatment of the Typhoid and Paratyphoid.**—*Sei-i-Kwai Med. Jl.* 1914. Dec. 10. Vol. 33. No. 12. (Whole No. 394). pp. 73–81. With 8 charts. (The Original in No. 21. Vol. 28 of the *Jl. Tokyo Med. Assoc.*).

Ichikawa employed a vaccine prepared by sensitising typhoid bacilli with the serum of convalescent typhoid patients. Ten loops of young culture of typhoid are mixed with 10 cc. of serum, and after 5–6 hours contact at 37° the bacilli are washed in salt solution and suspended in 100 cc. saline containing 0·3 per cent. carbolic, and well shaken. For use 0·5 cc. of this was added to warm saline and slowly injected into a vein. As a rule shortly after the injection a rigor developed and the temperature rose (perhaps to as high as 40·7° C., usually not so high). This rise was followed by a sharp fall, which in most cases reached normal and stayed there. In some cases the

temperature might rise again, but was less high and more intermittent than before, and a repetition of the injection again brought it down. Exceptionally a third dose might be required. In 87 cases treated in this way he had a mortality of 11 per cent., a marked improvement on the 30 per cent. mortality usually obtained in the hospital where he worked, to which only severe cases are admitted. Of the fatal cases two were hopeless on admission, and the rest died from intervening complications. He observed a tendency to haemorrhage after the injection, but it was never serious, but he urges caution in cases of pregnancy or weak heart-action. In seven cases of infection with paratyphoid B he used the same typhoid vaccine and with the same success. Given subcutaneously (23 cases) the results were more irregular and uncertain.

J. H. S.

von Korányi.—Budapest. **Zur Vakzinebehandlung des Typhus abdominalis.** [Vaccine Treatment of Typhoid]—*Wien. Klin. Woch.* 1915. Jan. 28. Vol. 28. No. 4. pp. 85–86.

Korányi reports briefly on 29 cases treated with a vaccine prepared by Ichikawa's method of sensitising the organisms with convalescent serum [see above]. Of this 0·3 cc. was found to be too small a dose and 0·7–0·8 cc. too large. Twenty-four received 0·4–0·5 cc., and all showed the rigor and usual fall of temperature, even to much below normal. Seven recovered with a critical fall, three were unchanged, seven improved and three recovered with a short lysis. The duration of the disease before vaccination appeared to be of much importance; the earlier the treatment, the better the results. He regards the method as an undoubted improvement in treatment.

J. H. S.

Danysz (J.). **Essais de Chimiothérapie dans la Fièvre paratyphoïde expérimentale.**—*C. R. Soc. Biol.* 1915. Jan. 8. Vol. 77. No. 33. pp. 559–561.

Danysz determined that the always fatal dose for white mice of paratyphoid bacilli [A or B ?] was 20–30 bacilli when introduced subcutaneously, but that 50,000 were necessary when introduced into the mouth through a tube, and over a million if given on bread. Small amounts of the phosphates or cacodylate of calcium, given subcutaneously 1–3 days before, would protect against a certainly fatal dose given by the mouth. Small quantities of antiseptics, such as salts of mercury, silver, copper, arsenobenzol, on the other hand, reduced the resistance. He suggests that it might be possible to apply this to man.

J. H. S.

Carnot (P.) & Weil-hallé (B.). **La Biliculture au Cours de la Fièvre Typhoïde.**—*C. R. Acad. Sci.* 1914. Nov. 30. Vol. 159. No. 22. pp. 749–752.

Bile was obtained from the patient in one of two ways, either (1) by withdrawing the stomach-contents an hour after the ingestion of 150 gm. sterile olive oil, the oil having induced pyloric regurgitation

of bile; or (2) by inducing the patient to swallow a small open glass bulb attached to a slender rubber tube 1 metre long; after 3–4 hours the bulb passes the pylorus into the duodenum, and aspiration on the tube brings up a clear yellow fluid, largely bile, from which cultures were made. At the beginning of the fever and during the whole of the septicaemic period (which, the writers are inclined to think, is longer the greater the severity of the attack) the bile contains no typhoid bacilli. With their disappearance from the blood the organisms appear in the bile, and positive results are obtained throughout the rest of the attack, the convalescence and often after clinical recovery. In favourable cases they may disappear by the 30th day of the disease, but the authors found them still present as late as the 94th day. They claim that a higher percentage of positive results is got from examination of the bile than from the faeces, and that the method may be of value when the blood culture is negative and agglutination is complicated by previous vaccination. [No indication is given in this paper of the number of cases examined in these ways].

J. H. S.

ROUSSEL. **Bacilles paratyphiques atypiques isolés par Hémoculture.**—*C. R. Soc. Biol.* 1914. May 8. Vol. 76. No. 15. pp. 721–723.

In 303 positive blood-cultures made in Algeria in 2½ years Roussel 227 times obtained the typhoid bacillus and 76 times a paratyphoid bacillus. He tabulates the cultural characters of four of the latter as atypical organisms, but his table chiefly illustrates the necessity of some international standardisation of the tests to be applied to bacilli of the Coli-Typhoid group.

J. H. S.

BLAKER (G. H.). **Note on the Preparation and Standardisation of Typhoid Vaccine.**—*Indian Jl. Med. Research.* 1914. Apr. Vol. 1. No. 4. pp. 726–728.

Blaker finds that the growth of typhoid on mutton broth (beef broth being inappropriate for Hindus) is more vigorous when the broth is sterilised in a Koch's steriliser than when sterilised in an autoclave.

J. H. S.

DREYER (Georges) WALKER (E. W. Ainley) & GIBSON (Alexander G.). **Typhoid and Paratyphoid Infection. No. 2.—The Detection and Identification of *B. typhosus* and *B. paratyphosus*.**—*Lancet.* 1915. Mar. 27. pp. 643–647. With 2 figs.

As the result of a series of tests of the three differential media in common use for the isolation of typhoid and paratyphoid bacilli, the writers conclude that Endo's, MacConkey's, and the Drigalski-Conradi media all to some degree inhibit the growth of these bacilli, and this to a greater extent than *B. coli*. Drigalski-Conradi was least efficient, MacConkey only slightly better, and Endo distinctly the best. Typhoid was not recovered from the first two when there were more Coli present

than 10 for each typhoid bacillus, nor from Endo when the proportion was more than 15 to 1; but when unmixed cultures were plated, many more typhoid grew on Endo than on the others. It is necessary, however, to use the Endo medium at the correct point of dryness. A too dry plate gave very unsatisfactory results. [Tests of this character usually give discordant results in the hands of different workers. The result depends largely on small points of preparation or handling, such as this of drying, and different workers seem usually to get the best results with the medium to which they are most accustomed.]

The authors have been successful in isolating both typhoid and paratyphoid from faeces, where the ordinary methods failed, by the use of an arc light. An ordinary agar plate is sown with a relatively large quantity of faecal emulsion, and by a simple arrangement portions of the plate are exposed for times varying from 30–240 seconds to the rays of an arc light so constructed as to give a cold illumination. From mixtures containing 50 Coli to 1 Typhoid the latter organism has always been readily isolated, and even with a proportion of 200 to 1 they have been usually successful. Their practical experience with the method has as yet been small, but further results will be awaited with interest.

J. H. S.

LEISHMAN (William). **Anti-typhoid Inoculation.**—*Jl. R. Army Med. Corps.* 1914. Apr. Vol. 22. No. 4. pp. 365–377.

The British records contain evidence in regard to the use of anti-typhoid vaccination unequalled in the publications of any other country for completeness, accuracy, duration or satisfactory control, and it is of interest to read in this, a paper read to the International Medical Congress, Sir W. Leishman's opinions on the method he had so large a share in elaborating. Some of the points he discusses we need not refer to here, but it is worth noting that he finds no reason to think a highly virulent strain gives better immunity than the low-virulence strain hitherto used, and that the uniform ratio in the incidence on inoculated and uninoculated of typhoid contracted in countries so diverse as Egypt, India, South Africa and West Indies, gives no support to the suggestion that a polyvalent vaccine would be more efficient. He believes that a successful vaccine must produce some degree of reaction, both local and general, although he is inclined to think that individuals who show excessive reactions on inoculation are unlikely to develop a satisfactory immunity to subsequent infection. It is satisfactory to find him making light of the supposed "negative phase" risk. Reprinted from the Report of the Anti-Typhoid Committee is a table giving the effect of inoculation in the 24 "Test Units" in India, and (along with a table showing the incidence of typhoid in the Indian troops since 1890) is an additional table giving the inoculation figures for 1911 and 1912 in India. Per 1,000 strength of the troops there were amongst the inoculated in 1911 1·7 cases with 10·37 per cent. mortality, and in 1912 1·2 cases with 12·8 per cent., whilst amongst the uninoculated there were in 1911 5·9 cases with 17·18 per cent. deaths, and in 1912 5·6 cases with 40 per cent. deaths. Statistical evidence, confirming the experimental, is given to show

that antityphoid vaccination confers no immunity against paratyphoid infection. This produced 168 cases in the two years 1911 and 1912; of these only 4 died and all but 5 were due to the *B. paratyphosus* A.

J. H. S.

DREYER (Georges), WALKER (E. W. Ainley) & GIBSON (Alexander G.).—**Typhoid and Paratyphoid Infection in Relation to Antityphoid Inoculation, together with Remarks on the Importance of the Use of Prophylactic Paratyphoid Inoculation.**—*Lancet.* 1915. Feb. 13. pp. 324–328. With 1 chart.

The serious importance of paratyphoid infections is well shown in this paper. At the base hospital in Oxford to date only eight cases of typhoid fever were met with, and as many as six cases of paratyphoid infection with the *B. paratyphosus* B, of which two were apparently infected also with the *paratyhosus* A. Of these six three were in patients recently inoculated against typhoid, and they illustrate (1) the now established fact that such inoculation confers no protection against paratyphoid infection; (2) the manner in which inoculation statistics are vitiated when full examination is not carried out in every case; (3) the desirability of prophylactic inoculation with all three organisms, a point on which the authors insist, recommending the use of mixed vaccines. They point out that inoculated individuals may show a high agglutination titre, and state that the most practical way of determining whether such patients are suffering from active typhoid fever is repeated investigation of the maximum titre of the serum with standard suspensions of typhoid and the two paratyphoid bacilli. Agglutination due to inoculation remains at a constant level but in active fever the titre rises or falls according to the stage of the disease. The highest titre is obtained with the bacillus producing the fever: should agglutination occur with more than one of the three organisms, the repeated examination will show the agglutination curve of the second organism running parallel to that of the first, if it is an instance of co-agglutinin production, but not parallel, even perhaps crossing, if there is a mixed infection. [Some of these statements require a good deal of confirmatory evidence, which is at present held over.] Their method of preparing the standard stock suspensions necessary to make comparable the repeated observations on different days is described, macroscopic examination being used.

J. H. S.

CASTELLANI (Aldo). **Note on Typhoid-Paratyphoid Vaccination with Mixed Vaccines.**—*Centralb. f. Bakt.* 1. Abt. Orig. 1914. Vol. 72. No. 6/7. pp. 536–543.

Castellani has at different times insisted on the advantage of using mixed typhoid and paratyphoid vaccines in countries where both infections are common, and he here gives again briefly some of the data in his hands, which go to show that such vaccines are not only harmless but establish immunity to all the three organisms. He has made several thousand such inoculations both with dead and with attenuated live vaccines with results no more serious than attend

ordinary typhoid vaccination. The immunity attained, as gauged by the production of agglutinins alone, was estimated in a small series of individuals and reached much the same height for each of the organisms as was obtained by separate inoculations of each organism in the same dose. He states that " when the immunisation is obtained by a single inoculation, provided the minimum dose sufficient to obtain the maximum immunisation be given, the amount of aggluti ins, etc. elaborated by the inoculated animals is not in proportion to the amount of culture injected "—a remark to which it is difficult to attach any precise significance. He recommends for routine use a vaccine killed at 53° C., containing 500 million typhoid and 250 million of each paratyphoid in 1 cc., and a first dose of 0·6 cc., and a second of 1·2 cc.

J. H. S.

WADE (E. M.) & MCDANIEL (O.). **Observations on the Widal Reaction following the Administration of Typhoid Vaccine.**—*Amer. Jl. Pub. Health.* 1915. Feb. Vol. 5. No. 2. pp. 136–146.

In a Hospital for the Insane 1,179 persons were vaccinated, each receiving three injections at 7–10 day intervals, and the serum of these individuals was tested for Widal reaction before injection, 7–10 days after each injection and at intervals afterwards up to a month or more after the last injection. All were negative before injection, and 92·8 per cent eventually gave a positive Widal, 3·7 per cent. a partial reaction, and 3·5 per cent. a persistent negative. At the time of the third dose 75·1 per cent. were already positive, and 89·3 per cent. positive ten days later. Of the 44 which never showed more than a partial reaction 19 very quickly (14 days after third injection) lost all trace of agglutinins. Out of the 1,179 persons 805 were examined again six months or one year later, 35 of these being patients who had given partial or no reaction after completion of immunisation. Of these 35 none gave agglutination at the later examinations. In the remaining 770, 68·2 per cent. were negative at the later examination, 8·8 per cent. partial and only 23 per cent. positive. After one year only 11·7 per cent. of 177 persons examined were still positive.

In a second Institution a similar examination was carried out, though less thoroughly. Of 1,396 cases vaccinated 37 per cent. gave a positive reaction 10–30 days after the third dose, 19 per cent. were atypical, i.e. partial, and 44 per cent. gave a negative reaction—a surprisingly high percentage of failures, for which the writers could find no explanation.

J. H. S.

DYER (A. W.) **The Agglutination Reaction after Anti-Typhoid Inoculation.**—*Indian Jl. Med. Research.* 1914. Apr. Vol. 1. No. 4. pp. 729–734. With 3 charts.

Dyer examined at Kasauli 182 non-commissioned officers and men who had previously been inoculated with typhoid vaccine. Of these 42 had been inoculated within 12 months, and of them six were positive in serum-dilutions of at least 1 : 160,15 in 1 : 80, and all but 4, i.e. 90·5 per cent., in upwards of 1 : 16. Sixty-three had been inoculated

between 12 and 24 months, of whom 1 reacted in 1 : 160,1 in 1 : 40, and 22·2 per cent. in higher dilutions than 1 : 16. Seventy-three had been inoculated more than 24 months previously, and of these only 4, or 5·2 per cent reacted in higher dilutions than 1 : 16, and none higher than 1 : 20. Dyer concludes that in a patient inoculated over six months previously a reaction of 1 : 40, i.e. 2½ times above the normal limits, indicates that the patient probably has typhoid fever. The test strain of typhoid used in these experiments was that employed at the Kasauli Pasteur Institute for routine Widal examinations, and against the serum of 500 healthy individuals was shown in 1911 "never to agglutinate with normal serum in a dilution above 1 : 16."

J. H. S.

TROWBRIDGE (E. H.), FINKLE (B. A.) & BARNARD (Elizabeth M.).—**Report of Typhoid Epidemic occurring three Months after the Use of Prophylactic Vaccine.**—*Jl. Amer. Med. Assoc.* 1915. Feb. 27. Vol. 64. No. 9. pp. 728–731.

In the Minnesota School for Feeble-Minded and Colony for Epileptics at Faribault an outbreak of typhoid occurred in the early spring of 1914 and, investigations having revealed the presence of eight carriers, 1,520 patients were inoculated prophylactically. Three months after the inoculations were completed, the milk supply to the Institution was contaminated with typhoid, and a second outbreak occurred amongst the inmates. There were in all 57 cases, of whom 44 were in inoculated and 13 in uninoculated individuals. No information is given as to the number of uninoculated persons exposed to infection, but if all the 1,520 were so exposed, the incidence in the inoculated was 2·9 per cent. The mortality in the inoculated was 9·1 per cent., in the unvaccinated 23 per cent. and, although the course of the disease was not apparently shortened in the vaccinated, they failed to give many of the classical symptoms. Three prophylactic injections were given of the State Board of Health vaccine, but it is noteworthy that out of 1,390 persons examined 46·6 per cent. after completed vaccination gave a negative Widal, and in 127 persons 52·7 per cent. gave a positive Widal after the second dose and only 29·1 per cent. after the third dose—a remarkable occurrence if the examinations were made at the proper intervals after injection. [This outbreak illustrates clearly the recognised fact that antityphoid vaccination does not confer complete protection, but reduces the mortality and the incidence. It is a pity more details are not given, e.g. from three cases *B. paratyphosus* was isolated, and it is not clear how many were fully examined bacteriologically, though only two out of 46 patients examined agglutinated *B. paratyphosus*.]

J. H. S.

CHOLERA.

SIMPSON (W. J.). **The War and Cholera.**—*Trans. Soc. Trop. Med. & Hyg.* 1915. Mar. Vol. 8. No. 5. pp. 139–158.
War and Cholera. [Abstract of Paper read at the Society of Tropical Medicine & Hygiene.]—*Lancet.* 1915. Apr. 10. pp. 741–747.

An interesting consideration of the likelihood of the addition of epidemic disease, in particular cholera, to the disasters of war, flood and famine, best read in its entirety.

After considering the disease historically the author turns to its connection with war. Only three European wars, the Russo-Polish in 1831, the Crimean, and the Balkan, have been associated with cholera. As there were epidemics during 1914 in Russia, Hungary, Austria, Germany and Turkey, there is reason to fear its spreading in the fighting lines this August. Protective measures should at once be undertaken. The degree of protection afforded by Haffkine's inoculation is shown by the fact that with inoculated and uninoculated living side by side in the same huts the giving of a living vaccine lowered the mortality in one epidemic from 10·86 per cent. to 2·99 per cent. Using a stronger vaccine, with very large numbers under observation (over 13,000) the incidence in the uninoculated was 3·02 per cent. with mortality 1·89 per cent., while amongst the inoculated it was 0·47 per cent. with a mortality of 0·24 per cent. This protection is not to be relied upon for more than 14 months. Killed cultures have been very largely and effectively used in Japan, Ceylon and Greece (on half a million persons in Greece during the Balkan war). The author recommends CASTELLANI's method of giving mixed cholera, typhoid and paratyphoid A and B vaccine as a means of saving time and trouble.

In the discussion that followed Sir Ronald ROSS suggested as one reason for the present lack of greater popularity in India of HAFFKINE's anti-cholera vaccination, that HANKIN's method was more suitable for treating the natives there. In answer to questions by the President, Sir Havelock CHARLES, Simpson pointed out that while experiments on animals indicated that subsequent to cholera inoculation there was a period of lowered resistance to the disease the careful observations on man in India showed no trace of this. That in Bulgaria during the 1913 war a fall in immunity appeared to follow inoculation, might be the result of insufficient supervision and verification of facts, occasioned by the exigencies of the time, the apparent lowering of immunity being in reality due to an inoculation taking place during the period of incubation.

H. Schütze.

HEISER (Victor G.). **Cholera in the Philippines during 1913.**—*Med. Rec.* 1914. Nov. 14. Vol. 86. No. 20. (Whole No. 2297). pp. 827–829.

In August 1913 cholera cases occurred in Manila. From the continued examination of the stools of all steerage immigrants and of those

coming from cholera parts it did not seem that the disease had been imported from abroad; and for almost two years there had been no cholera anywhere in the Philippines. Arguing from these data, together with the fact that cases at the beginning of an outbreak often occur simultaneously and without discoverable connection, the author suggests that the cholera vibrio may pass through a cycle and in some of its stages escape detection by present laboratory methods, at some subsequent period entering the stage which gives rise to the disease and by passage through a number of persons increasing in virulence. Eighty per cent. of the cases occurred in houses without modern sanitary arrangements. Of 876 contacts examined in connection with 72 cases, 40 showed the presence of vibrios of some sort, and 29 of Koch's vibrio. Prompt measures taken by the authorities quickly suppressed the various local outbreaks, the prophylactic measures being—isolation of sick and carriers, disinfection of excreta, safeguarding of food and water supply; treatment in the main consisted of intravenous transfusion of saline.

H. S.

BRAHMACHARI (B. B.). **A Short Note on Cholera as an Endemic in Cossipur-Chitpur, Bengal.**—*Proc. Third All-India Sanitary Conference held at Lucknow Jan. 19–27, 1914.* Vol. 4. Papers Suppl. to *Indian Jl. Med. Research.* pp. 102–113.

A consideration of the mortality rate and the chief factors of importance in the endemic at Cossipur-Chitpur, such as fairs, immigrants, meteorological conditions, etc., with an account of the difficulties met with in combating it. A translation of a pamphlet circulated among the inhabitants is appended.

H. S.

i. NEUMANN (Hugo). **Ueber Cholera asiatica.** [On Asiatic Cholera].—*Wien. Med. Woch.* 1915. Jan. 2. Vol. 65. No. 1. pp. 26–31.
ii. GAERTNER (G.). **Bemerkungen zur Pathologie und Therapie der Cholera asiatica.** [Observations on the Pathology and Therapy of Asiatic Cholera.]—*Ibid.* Jan. 23. No. 4. pp. 182–186.

i. In October and November 1914 in Krems on the Danube 400 cases of cholera, mostly of a light nature, occurred in one infantry regiment, the cause being vibrio infected drinking water. The author was concerned with 129 of the more severe cases. He divided them into two groups, (1) with cholera diarrhoea, (2) algid or comatose cases. In the first group were 95 cases and only three were bacteriologically positive; of these three, one presented no features different from the negative cases, one had a high pulse rate and one became subsequently comatose and died. This last case was examined two or three times by Professors KRETZ and HELLY but the Koch bacillus was never isolated. Of the 36 very severe cases most of the fatal ones gave positive bacteriological results, but the prognosis was not greatly helped by the laboratory finding as there were several "positives" who recovered and one "negative" who succumbed. The following table gives at a glance the result of bacteriological investigation in the 36 severe cases.

	The bacteriological finding was		
Number of severe cases.	positive	negative	uncertain
36	18	15	3
Of these were fatal			
12	8	1	3

The author considers attentive and careful nursing the great desideratum in cholera, and that the lowered blood pressure is the chief sign to be followed both for prognosis and therapy. Most cases were extremely apathetic; two showed marked restlessness. In three cases a rash was seen; one began as raised, milletseed spots, at first pink, then dark red, on the extensor surface of the extremities, subsequently spreading rapidly over the whole trunk and face, resembling on the second day measles; afterwards it became confluent and resembled urticaria. Another commenced on the abdomen; the face was involved, an erysipelatous condition resulting. The hyperaemic patch disappears on pressure and shows in the centre a small pin-point-sized transparent blister. No prognostic importance could be attached to the rash; in one case it preceded rapid recovery, in another equally rapid death. The author places most reliance on a therapy in which warmth and restoratives play a big part. A mustard bath (40°–42° C.) for not longer than eight minutes, with subsequent vigorous rubbing down, the application of warm sand bags all over the body, and the administration of hot red wine or black coffee, he considers most effective. The reaction of the skin to this bath he regards of prognostic value. The injection of 1·5 per cent. saline subcutaneously or physiological saline intravenously does not give such good results. Camphor is given as soon as the pulse shows signs of failing. For internal medication:—bolus alba and opium with iodine tincture to counteract the tendency to vomit; calomel and castor oil if meteorismus is present. The author did not find the disease clinically contagious and considers that, if the stools are disinfected, there is no need for strict isolation.

ii. Discussing this communication, Gaertner pointed out that the epidemic, with which Neumann had had to deal, did not seem to be a severe one and probably for the reason that his hospital only received patients who had outlived the first days of illness, those days which show the highest mortality returns. Another point in favour of the observation that the more severe cases did not reach the hospital, is that Neumann apparently did not have patients with anuria. The author found during the Hamburg epidemic that cases without anuria had a mortality of 0 to 4 per cent., while those with anuria had one of 55 to 60 per cent. That Prašek during the first siege of Przemysl saw a cholera mortality of 50-60 per cent. in cases untreated or at most only given iodine tincture, was evidence that virulent cholera organisms were present. With regard to treatment

the author thought hot baths might assist the circulatory system, but pointed out that WINTERNITZ achieved similar results in earlier epidemics with cold baths and cold massagings. The author spoke strongly in favour of intravenous hypertonic saline injections (which he claimed to have advocated 16 years before ROGERS). PRAŠEK, whose mortality of 50–60 per cent. for untreated cases at Przemysl has been quoted above, lowered the death rate to 18–20 per cent. by giving a 5 per cent. saline injection subcutaneously, while a fellow worker using by mistake a 1 per cent. solution did not get a lowered mortality. WIENER gave a 2 per cent. solution intravenously and observed congestive head symptoms. The author thinks it remains to be decided which is the optimum strength of saline solution to be used, but considers that 0·6 g. Na Cl to 1 kg. body weight might be about right; thus one would give 2,000 gm. of a 2 per cent. solution or 800 gm. of a 5 per cent. solution to a person weighing 70 kg. He also considers the addition of glucose to the saline advisable, for the purpose of dilating the renal blood vessels and stimulating diuresis. A 9 per cent. glucose solution has been given intravenously and well stood.

H. S.

STERNBERG (Carl). **Zur Epidemiologie und Bekämpfung der Cholera.** [The Epidemiology of and the Campaign against Cholera.] —*Wien. Klin. Woch.* 1915. Apr. 8. Vol. 28. No. 14. pp. 361–367.

Observations on some 275 cases of suspected cholera. Nothing of great interest. One hundred and eight cases were diagnosed bacteriologically as cholera and showed a mortality of 42·6 per cent., none of the patients having had prophylactic cholera inoculations. The vibrios disappeared from the stools sometimes as early as the sixth or seventh day, but generally not until the eleventh or fourteenth. On two occasions the *V. cholerae* was isolated from corpses buried eleven and fourteen days respectively. Great irregularity marked the finding of carriers among contacts. No hospital nurses or attendants developed into carriers or acquired the disease, which was in marked contrast to the occurrence of various small local epidemics around cases treated in private. In support of the possibility of carriers subsequently developing the disease, the author instances the case of a contact who developed cholera eleven days after isolation.

H. S.

BRADDOCK (C. S.), Jr. **Some Notes on Asiatic Cholera; its Prevention and Treatment.**—*Internat. Clin.* 1914. Ser. 24. Vol. 4. pp. 68–75.

For the most part a resumé of known facts concerning cholera. The author does not believe in the efficacy of saline transfusions, but pins his faith to "keeping the blood where it belongs," viz. in the blood vessels. His treatment is (1) to prevent vomiting so as to retain the remedial drugs, by giving cocaine, creosote and cerium oxalate; (2) to administer stimulants and diuretics, such as digitalis, nitroglycerine and tincture of eucalyptus in extremely large doses, which he finds

are alone of use in cholera patients ; (3) to prevent the escape of serum from the blood vessels by means of large quantities of some modified tannic acid preparation, such as protan. Great stress is laid on the complete withholding of food for 36 hours or longer. No numerical results are given.

H. S.

SALUS (G.). **Kurze Mitteilung über Untersuchungsergebnisse bei Cholera und bei bazillären Ruhr.** [A Note on the Diagnosis of Cholera and Bacillary Dysentery.]—*Prager Med. Woch.* 1915. Jan. 14. Vol. 40. No. 2. p. 15.

As showing the importance of examining the stools of all people coming from a cholera infected region, the author quotes seven cases of soldiers arriving within a few weeks of one another from the Russian war zone without any clinical suspicion of cholera attached to them and yet whose stools readily yielded cultures of the comma bacillus. In two the blood was examined for agglutinins but none was found. In one case with symptoms of a typhoid nature the Widal test was positive at 1 : 100 and from the stools both *B. typhosus* and *V. cholerae* were isolated. The author found the Peptonwater method excellent, although the formation of a skin on the surface was not constant ; the first culture could always be used for agglutination purposes and usually for macroscopic agglutination.

H. S.

ARZT (Leopold). **Ueber Cholera und Cholera-Vakzination.** [Cholera and Cholera-Inoculation.]—*Wien. Klin. Woch.* 1914. Nov. 19. Vol. 27. No. 47. pp. 1502–1505.

Observations on 25 cholera cases seen in Cracow during three weeks of October, 1914. Bronchopneumonia was often a late complication, giving a fatal termination to convalescent cases or considerably prolonging that convalescence. Three cholera cases were accompanied by a rash in the form of lentil-sized maculae which subsequently became confluent and often had small central fleabite-like haemorrhages. The accompanying joint pains and the transient nature of the rash pointed to a toxic origin. Two cases which had received anti-cholera inoculations, the one two days before the beginning of the attack and the other actually during its first stages, ran mild courses and did not suggest the existence of any negative phase.

H. S.

de VOGEL (W. Th.). **Sur un Mode de Propagation du Choléra par Mer.** —*Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon (1913).* 1914. pp. 259–263. With 1 plate.

A warning of the danger attendant on the building of ships with nightsoil scuppers discharging above the water-line, so that where loading and unloading are carried out by means of lighters, the crews of these boats coming directly in contact with the soiled sides of the vessel run great risk of being infected, if there are cholera carriers on board.

H. S.

POTTEVIN (H.). **Instructions pour le Prélèvement, l'Envoi et l'Examen des Fèces en Vue de la Recherche du Vibrion cholérique.**—*Bull. Soc. Path. Exot.* 1915. Mar. Vol. 8. No. 3. pp. 98–103.

Simple and concise rules for the taking, dispatching and examining of suspected cholera stools, needing to be read in their entirety. The author draws the following conclusions from his examinations :—(1) If two stools, taken with an interval of 24 hours, both give negative results the person may be regarded as not infected with cholera. (2) If a vibrio agglutinating with cholera serum be isolated the person, no matter what his state of health, *must be regarded as dangerous and isolated like a cholera patient.* (3) If a morphologically and culturally typical vibrio, inagglutinable with cholera serum, be isolated from a stool, the person, in view of the rarity of the presence of vibrios of any kind in the human intestine and the known occurrence of cholera strains that are inagglutinable when recently recovered, had better be isolated like a proved carrier. The examination of carriers should be repeated every 24 hours ; isolation may cease after two negative results have been obtained.

H. S.

CROWELL (B. C.). **Notes on the Diagnosis of Asiatic Cholera at Autopsy.**—*Philippine Jl. of Sci.* Sect. B. Trop. Med. 1914. Aug. Vol. 9. No. 4. pp. 361–365.

Pathological experience in the autopsies of 92 cases. In his summary the author remarks " that while probably no one anatomical feature is constant, the following features are the ones on which a diagnosis is chiefly based :—Acute catarrhal enteritis associated with (1) cyanotic finger nails, (2) dry tissues, (3) oligaemia, (4) dry and sticky peritoneum with pink serosa of ileum, (5) contracted and empty urinary bladder, (6) shrunken, dry spleen and liver, (7) acute degeneration of parenchymatous organs, (8) poorly coagulated blood, (9) absence of formed faeces, (10) presence of rice-water intestinal content and (11) prominence of lymphoid tissue in the ileum."

With regard to bacteriological confirmation of post-mortem diagnoses in 87 cases there was agreement between the two ; five cases were anatomically negative, but bacteriologically positive, these being cases in which some other disease, such as acute peritonitis from a strangulated hernia or generalised tuberculosis, gave a dominating impression.

H. S.

DEDEKIND (Franz). **Choleraimpfphlegmonen.** [Cellulitis after Cholera Inoculation.]—*Med. Klin.* 1915. Feb. 7. Vol. 11. No. 6. pp. 158–159.

An account of 18 cases of cellulitis at the site of inoculation, occurring in a reg ment which was inoculated against cholera apparently without any preparation of the skin or any sterilisation of the hypodermic syringe between man and man. All cleared up rapidly on incising and draining. A similar outbreak to this one, which took place in Leipnik (Moravia), occurred in Bohemia.

H. S.

MILNE (Charles). **An Interesting Sequela in a Case of Cholera.**—*Indian Med. Gaz.* 1915. Feb. Vol. 50. No. 2. pp. 58–60.

An account of an intestinal haemorrhage accompanied by acute pain in the epigastrium developing in a cholera conval scent, which the author considered due to an erosion in the duodenum, caused either by one of the permanganate pills administered, settling there and cauterising the bowl wall or by toxic absorbtion from the colon with vago-tonic influence, it having been suggested by WILKIE that a definite relationship exists between duodenal ulcers and morbid conditions of the lower bowel.

H. S.

OBREGIA & PITULESCO. **Études sur les Psychoses du Choléra.**—*Encephale.* 1914. pp. 393–402.

From their observations on some 2,000 cases of cholera in the Roumano-Bulgarian war of 1913 the authors distinguish the following mental forms :—(1) Depressive : the signs of sadness, discouragement, even anguish occur before other clinical signs are even apparent ; complaints of thirst and great unrest ; the sensations of anguish are referred to the praecordial region of the chest ; a dread of the disease does not play a big part in the " anguish," which is caused by the state of dehydration of the blood and the anuria. (2) Asthenic : a condition of absolute immobility and stupor, often accompanied by an optimism that considers the symptoms merely those of fatigue. (3) Delirious : associated with mental confusion, loss of memory.

H. S.

RENAULT. **Notes on the Treatment of Cholera by the Exhibition of Chlorhydrate of Emetine in Hypodermic Injections.**—*Indian Med. Gaz.* 1914. July. Vol. 49. No. 7. pp. 270–271.

During a violent epidemic with high death-rate [actual figures not given] in Pondicherry, the author used emetine chlorhydrate, 1 in 100, hypodermically, the doses being graduated from 4 centigrammes per day for patients over 25 years of age to 1 centigramme per day for patients between 1 and 8. Forty-four recovered out of 60 cases treated ; roughly 73 per cent. of cures. He considers the treatment specially useful owing to its simplicity and the fact that it is little likely to be objected to by natives.

H. S.

ROGERS (Leonard). **Emetine in Cholera.**—*Indian Med. Gaz.* 1915. Jan. Vol. 50. No. 1. pp. 4–5.

Half a grain of emetine hydrochloride was injected hypodermically morning and evening in addition to the routine use of intravenous hypertonic saline injections and the giving of permanganates. As the cholera mortality varies from month to month and in different periods of an epidemic, alternate cases only received emetine, the others remaining as controls. After 32 had received the treatment it was stopped as no benefit appeared to follow. The following table gives the results and shows at the same time how nearly equally the four factors which so greatly influence the prognosis of a case, occur in the two groups.

TABLE I.

The Principal Factors Influencing the Mortality of Cholera.

	Emetine Cases.	No Emetine.
Cases with no pulse on admission ..	10	15
Cases with Sp. Gr. over 1,065.. ..	8	3
Cases requiring two or more intravenous saline injections.. ..	10	10
Patients over the age of 50 years ..	1	1
Deaths among 32 cases	4	4

The low mortality figures obtained by RENAULT [see above] with emetine do not prove the efficacy of the drug, as control cases were not observed and apparently severe cases did not receive the treatment.

H. S.

PRAŠEK (E.). **Subkutane Infusionen fünfprazentiger Kochsalzlösung als Therapie der Cholera asiatica.** [Subcutaneous 5 per cent Saline Injections in the Treatment of Cholera.]—*München. Med. Woch.* 1914. Dec. Vol. 61. pp. 2390–2391.

Not all cases, during this outbreak in Przemysl, received saline injections, but every case received tincture of iodine, three drops in water 4–5 times a day, which though very efficacious in stopping vomiting did not, when given alone, seem to lower the mortality, which remained about 50 per cent. Forty cases, many severe and apparently hopeless, received the following treatment :—Half a litre of 5 per cent. sterile salt solution at 37° C. was given subcutaneously in the abdominal region. This was repeated after six hours and sometimes a third injection was given on the following day. "Caffein sod. benzoic." was given several times subcutaneously in doses of 0·2 gram. With a better pulse the patient received a hot bath and massage of the limbs. Generally an improvement in all symptoms was noticeable after the first injection and recovery rapidly set in. The mortality was 18–20 per cent. This good result was apparently due to the hypertonicity of the salt solution ; a number of cases received by mistake a 1 per cent. salt solution and were not beneficially influenced by the treatment. Early treatment is very desirable. In every case cholera had been diagnosed bacteriologically.

H. S.

CADBURY (William W.) & HOFMANN (J. Allen). **The Treatment of Cholera by Transfusion of Saline Solution.**- *Jl. Amer. Med. Assoc.* 1914. Oct. 3. Vol. 63. No. 14. pp. 1200–1202.

In the summer of 1913 a severe epidemic of cholera broke out in Canton after ten years quiescence. An account is given of the treatment of cases in a hospital for the insane, at first with subcutaneous saline injections and little result, later with intravenous transfusions. Although only very rough and ready means could be employed, the results were good and no evidence of septicaemia or trouble from entrance of air into the circulatory system occurred. Six to ten

litres were given or until the flow of water from mouth and rectum pointed to the saturation of the blood. Excepting for the administration of dilute sulphuric acid saline was the only treatment. Of 27 patients transfused 74 per cent. recovered; of 17 not transfused 35 per cent. recovered, some of these non-transfused cases being thought too mild to need it.

H. S.

BRACHIO (J. J. A.). **Treatment of Cholera by the Intraperitoneal Injection of Iodine.**—*Indian Med. Gaz.* 1914. Aug. Vol. 49. No. 8. pp. 309–311.
Iodine in Cholera. [Correspondence].—*Ibid.* Oct. No. 10. p. 411.

A short account of the treatment of cholera with iodine by the mouth.

Tinct. Iod.	♏ 10
Acid Sulph. Dil.	♏ 10
Tinct. Digitalis	♏ 10
Aqua	ad oz. 1

One ounce every four hours.

Forty recoveries out of 54 cases treated; roughly 74 per cent. of cures. And with iodine intraperitoneally.

Iodum	gr. ¼
Pot. Iod.	gr. ¼
Aqua dest.	♏ 20

Twenty minims injected intraperitoneally.

Thirty-three recoveries out of 42 cases treated; roughly 79 per cent. of cures. Adrenalin solution, dropped on tongue, was given frequently as a cardiac stimulant and diuretic. [No mention made of the general mortality of the epidemic.]

H. S.

von FRENDL (E. R.). **Ueber die Anwendung des Kaliumpermanganats bei Cholera.** [The Use of Potassium Permanganate in Cholera.] —*Wien. Med. Woch.* 1914. Nov. 28. Vol. 64. No. 48. p. 2428.

An account of the treatment of 326 cases of cholera with, as sole internal medicament, potassium permanganate. The drug was given in dilute solution (0·1 : 1,000) as a beverage. The author claims that most striking results occur in every case; vomiting ceases after a few spoonfuls and the number of stools is greatly diminished after 24 hours. The good result remains permanent, unless the case is too severe.

H. S.

GROÁK (F.). **Behandlung der Cholera mit Thierkohle (Vorläufige Mitteilung).** [The Treatment of Cholera with Animal Charcoal. (Preliminary Note).]—*Wien. Klin. Woch.* 1915. Apr. 15. Vol. 28. No. 15. pp. 391–392.

A short note on the administration of animal charcoal in cholera; it was found that the 20 grams, which were given per day, should be

taken in water with brandy added and in small quantities every 10 minutes. Vomiting did not then ensue; 1–2½ litres of 1·5 per cent. [1·5 per thousand is mentioned, no doubt in error] saline were given subcutaneously per day. The mortality with this treatment was 12 per cent., the moribund and untreatable cases, however, not being included. No other statistics given. Animal charcoal was found of use in gastroenteritis of all sorts and in dysentery.

H. S.

Goff (A. P.) & Denney (Oswald E.). **Clinical Observations on Asiatic Cholera in Manila in 1914.** *Jl. Amer. Med. Assoc.* 1915. Apr. 3. Vol. 64. No. 14. pp. 1148–1151.

Continuous proctoclysis was found to be very beneficial, inducing evacuation in the "sicca" cases and encouraging kidney elimination, as seen by the fact that after this treatment was commenced a return of the renal secretions would be observed, while when it was interrupted a distinct decline in the urinary flow would take place.

H. S.

Greig (E. D. W.). **Lesions of the Gall-Bladder and Biliary Passages in Cholera: A Bacteriological, Histological and Experimental Study.**—*Indian Jl. Med. Research.* 1914. July. Vol. 2. No. 1. pp. 28–45. With 14 coloured plates.

For the purpose of discovering to what extent the gall-bladder and bilary passages are involved and show changes in cases of cholera, the author studied the post-mortem records of the Medical College, Calcutta, for the years 1894–1912, investigated a number of cases bacteriologically himself and carried out experiments on rabbits.

In 4 per cent. of the 235 cases in the post-mortem records some naked-eye signs of inflammation of the gall-bladder were seen. In his own series of 271 post-mortem examinations, signs of inflammation were found in 4·4 per cent. and the author thinks this figure should give "some idea of the number of cases of cholera which may become permanent carriers." In these visibly altered gall-bladders microscopic examination showed extensive structural alterations and many cholera vibrios situated in the depths of the bladder wall.

Microscopic changes in the wall of the gall-bladder: the partial or complete disappearance of the epithelial layer, the submucosa being in some cases thrown out in a series of ragged folds; inflammatory infiltration of the submucosa; foci of round cells in the middle and serous layers. The cholera vibrio was demonstrated histologically in the deeper parts of the submucosa, as the *B. typhosus* was by Bindseil in chronic typhoid carriers, and isolated in pure culture from the same site, the organisms lying superficially being destroyed by plunging the portion of bladder wall in alcohol and flaming. Similar microscopic changes were traced in the cystic duct, the hepatic duct and the common bile duct, vibrios being present in the wall throughout.

Round the bilary passages in the liver as well as between the liver cell columns, a round cell infiltration similar to that in the gall-bladder was seen. These changes of an inflammatory nature in the liver,

together with the presence of cholera vibrios in the liver substance itself, are regarded by the author of practical importance in considering the treatment of carriers. Were the focus of infection in such cases to be confined to the gall-bladder, it might be feasible to drain, scrape, or even remove it altogether.

Using rabbits and giving intravenous inoculations of the vibrio, the author was able to produce lesions in the gall bladder wall and the biliary passages of the liver similar in character to those found in acute cases of the disease occurring in human beings. It was also possible to recover the comma bacillus from the bile. In the inoculated rabbits marked changes in the mucous membrane of the duodenum and the presence of vibrios in the intestinal canal, pointed to an invasion of the gut via the intestinal wall. Certain cholera-like vibrios injected intravenously could, like the Koch bacillus, invade the tissues generally and be found subsequently in the various organs of the rabbit.

H. S.

GREIG (E. D. W.). **The Invasion of the Tissues by the Cholera Vibrio and Further Observations on Pneumonia in Cases of Cholera.**—*Indian Jl. Med. Research.* 1914. July. Vol. 2. No. 1. pp. 1–27. With 3 coloured plates.

An examination of nine cases for the presence of Koch's vibrios in the various organs shortly after death, with clinical and post-mortem notes. The author found the vibrios in every case to be widely disseminated throughout the body and from the histological evidence concluded that the lymphatic system is mainly the channel of distribution, which, he thinks, may explain why in spite of a considerable number of attempts in no case had he been able to isolate the organism from the blood during life.

H. S.

GREIG (E. D. W.). **On the Simultaneous Occurrence of Cholera and Cholera-like Vibrios in the Tissues of Cases of Cholera.**—*Indian Jl. Med. Research.* 1914. Oct. Vol. 2. No. 2. pp. 604–622.

An examination of the characteristics of certain cholera-like vibrios isolated in three cases of cholera along with the Koch bacillus. It was found that the cholera-like vibrios, while being morphologically and culturally like the true comma bacillus, were to be distinguished in that they (*a*) did not agglutinate with high titre cholera serum, (*b*) gave on inoculating into rabbits a serum which, while agglutinating the cholera-like vibrios, did not affect the true cholera vibrio, (*c*) did not salt out with high concentrations of magnesium sulphate. It was observed that broth cultures of the cholera-like vibrios in two out of the three cases haemolysed goat's blood, the Koch vibrio never doing so. The author warns against a bacteriological diagnosis of cholera without the fulfilling of these further tests.

H. S.

GREIG (E. D. W.). **The Haemolytic Action of Indian Strains of Cholera and Cholera-like Vibrios.**—*Indian Jl. Med. Research.* 1914. Oct. Vol. 2. No. 2. pp. 623–647. With 1 coloured plate.

No haemolytic action was observable in 333 cholera strains when the method employed was that of adding a three days old alkaline broth culture in varying quantities to a 5 per cent. suspension of goat's washed red corpuscles, letting the samples stand first for two hours at 37° C. and then over night in the ice chest; in 161 cases blood agar plates were used and examined not later than 24 hours (subsequent to that period clear zones may occur round the colonies, due to haemo-digestion) and the great majority showed no clear zones, a few only a slight indication.

The 100 cholera-like vibrio strains which were examined were morphologically and culturally similar to the true vibrio, those isolated from stools all being monociliated, a few from water having more than one flagellum, but they differed in that they did not agglutinate with high titre cholera serum and could not produce agglutinins for true cholera vibrios. All the 100 strains caused haemolysis, some to a marked extent. It was observed that after passing a broth culture through a Pasteur-Chamberland filter its haemolytic strength was greatly reduced. Anti-haemolytic sera were prepared from two cholera-like strains and each was found to inhibit haemolysis for the homologous strain but to give only partial inhibition in the case of the heterologous strain.

H. S.

GREIG (E. D. W.). **The Agglutinins in the Blood of Cholera Cases.**—*Indian Jl. Med. Research.* 1915. Jan. Vol. 2. No. 3. pp. 733–762. With 4 charts.

An examination of the agglutination titre in 363 cases of cholera. As control the author found, like PFEIFFER and KOLLE, that normal blood may only agglutinate cholera up to 1 : 20. A marked difference between fatal and non-fatal cases was observed. From the majority of the fatal cases (64 examined) no agglutinating serum was obtained, although some lived as long as 4, 5, 6, and 7, even 12 days; in a few cases 1 : 40 was reached. Of 210 non-fatal cases the majority showed well marked agglutination by the sixth day and agglutinins remained present until about the 20th when there was a drop. High titres, 1 : 400–1 : 1000, were frequently obtained. It was seen that during the early acute stage of the disease the agglutination test will not aid diagnosis; the clinical signs and bacteriological examination alone must be relied upon; but the finding of a high agglutination titre in a convalescent who comes to one with a suspicious history of illness, will materially help the diagnosis.

Carriers appear to retain a raised titre for some time and this fact should help in tracing such cases. An interesting point, indicating the non-pathogenic nature of cholera-like vibrios, was the observation that in 18 cases in which cholera-like vibrios, as well as true Koch

bacilli, had been isolated, and in 35 cases where no true cholera organisms but only cholera-like vibrios had been isolated, the blood serum contained only agglutinins for the comma bacillus and none for the cholera-like vibrios isolated from the patient's own stool.

H. S.

GREIG (E. D. W.). **On the Vitality of the Cholera Vibrio outside the Human Body.**—*Proc. Third All-India Sanitary Conference held at Lucknow Jan. 19–27, 1914.* Vol. 4. Papers. Suppl. to *Indian Jl. Med. Research.* pp. 81–101. With a chart.

Rice water stools kept in flasks at room temperature and protected from evaporation and the action of sunlight continued to show the presence of the cholera vibrio for a period which varied, according to the individual strain and the season of the year, from one day to seventeen, the temperature of Calcutta, where the experiments were carried out, ranging from the mean maximum, 102° F. in May to 48° F., the mean minimum in January. The table gives a summary of the results.

TABLE IV.

The following table shows the months in which examinations were made, the number of stools containing cholera vibrios examined, and the duration of life of the cholera vibrios :—

Months' examinations were made.	No. of stools containing cholera vibrios examined.	Duration in Days of Life of Cholera vibrios.		
		Minimum.	Maximum.	Average.
December 1912 ..	9	10	10	3·6
January 1913 ..	6	1	12	6·6
February ,, ..	13	3	17	7·7
March ,, ..	20	1	13	6·5
April ,, ..	22	1	5	2·8
May ,, ..	10	1	3	1·4
June ,, ..	15	1	2	1·2
July ,, ..	..	..	..	..
August ,, ..	4	1	12	6·0
September ,, ..	3	4	5	4·3
October ,, ..	3	3	4	3·7

In a smaller number of cases the actual number of organisms present at various stages was determined.

H. S.

SCHOEBL (Otto). **The Vitality of the Cholera Vibrio in Manila Waters.** —*Philippine Jl. Sci.* Sect. B. Trop. Med. 1914. Nov. Vol. 9. No. 6. pp. 479–481.

The result of the experiment is clearly given by the table. In each case 10 cc. of water were infected with varying quantities of rice-water stool.

TABLE I.

The vitality of the cholera vibrio in Manila waters.

Sample of water.	Amount of faeces in loopful.	Immediately.	Time in Days.																			
			1	2	3	4	5	7	9	11	13	19	27	35	43	56	66	76	86	96	106	122
H_2O sterile Temperature 25°–27° C.	1	+	+	—	+	—	+	+	—	—	—	—	—	—	. . .	. . .	. . .	. . .	. . .	. . .	. .	. .
	3	+	+	+	+	—	+	+	—	—	—	—	—	—	. . .	. . .	. . .	. . .	. . .	. . .	. .	. .
	5	+	+	—	+	+	+	+	—	—	—	—	—	—	. . .	. . .	. . .	. . .	. . .	. . .	. .	. .
	7	+	+	+	+	—	—	—	—	—	—	—	—	—	. . .	. . .	. . .	. . .	. . .	. . .	. .	. .
	9	+	+	—	+	—	+	+	—	—	—	—	—	—	. . .	. . .	. . .	. . .	. . .	. . .	. .	. .
Tap water not sterilized. Temperature, 25°-27° C.	1	+	+	+	+	—	+	—	—	+	+	+	+	+	+	+	—	—	—	—	—	. .
	3	+	+	+	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	. .
	5	+	+	+	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	. .
	7	+	+	+	+	+	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	. .
	9	+	+	—	+	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	. .
Sea water, sterile. Temperature, 25°-27° C.	1	+	+	—	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	—
	3	+	+	+	+	+	+	+	+	+	+	+	—	—	—	—	—	—	—	—	—	—
	5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	—	—	—	—	—	—	—
	7	+	+	+	+	+	+	+	+	+	+	+	—	—	—	—	—	—	—	—	—	—
	9	+	+	—	+	+	+	+	+	+	+	+	—	—	—	—	—	—	—	—	—	—
Specific gravity, 1,020.																						

H. S.

FLU (P. C.). **Over Hyp- en inagglutinabele choleravibrionen en hunne beteekenis voor de praktische diagnose der cholera.** [Inagglutinable and Weakly Agglutinable Cholera Strains and their Importance for a Practical Diagnosis.]—*Geneesk. Tijdschr. v. Ned. Ind.* 1914. Vol. 54. No. 5. pp. 524–539.

After reviewing the literature on the subject the author describes his own experiments carried on during the 1913 Batavian epidemic. His strains were mostly isolated from well and river water, but also from the gall bladder of cholera corpses. Of the 62 vibrios isolated from water, five corresponded to the true Koch comma bacillus.

AGGLUTINATION TABLE.

Serum used had titre 1 : 10000. Vibrios grown on ordinary agar.

Strain.	Date of Isolation.	Agglutination tested on	Titre reached.	Remarks.
I	30 Aug.	31 Aug.	1/1000	Isolated from 1 liter of river water.
		8 Oct.	1/3200	After 14 subculturings.
		25 Dec.	1/6000	Subcultured continuously every other day.
II	30 Aug.	1 Sept.	1/2000	Isolated from 1 liter of river water.
		8 Oct.	1/3000	After 14 subculturings.
		25 Dec.	1/7500	Subcultured continuously every other day.
III	24 Sept.	25 Sept.	Inagglutinable.	As liquid blood medium gave no haemolysis and on blood agar haemolysis occurred, vibrio was retested after 9 subculturings.
		30 Sept.	1/100	
		8 Oct.	1/2000	
		25 Dec.	1/4000	Subcultured every other day.
IV	6 Oct.	9 Oct.	1/3000	River water.
		25 Dec.	1/10000	Subcultured every other day.
V	8 Oct.	10 Oct.	1/10000	Well water; an inhabitant succumbed to cholera after bathing in it.

Eight strains isolated from the gall bladder gave with a 1/6000 serum agglutination up to titre limit in four cases, up to 1/100–1/150 in three, and in one no agglutination at all. The three weakly agglutinating strains agglutinated fully after a couple of subcultures. Three tests are necessary for the complete identification of a cholera vibrio that is inagglutinable: (1) it must be typical morphologically and culturally, (2) it must recover its agglutinability on subculturing, (3) it must on inoculating into rabbits produce a serum which agglutinates the true cholera vibrio. The author was unable to induce variation in the agglutinability by inoculating into sterilised, or unsterilised, unfiltered Batavian river water. He found that cholera vibrios disappear from water in a few days and even after enormous numbers have been added no vibrios can be found six days later. The author cannot agree with HOROWITZ in thinking that the connecting links between epidemic and epidemic are inagglutinable vibrios, leading a saprophytic existence outside man (at any rate in the tropics), but concludes that they must be sought in the sporadic cases of cholera which occur. Like HOROWITZ he thinks that

inagglutinability probably arises during the sojourn of the organism in a human being and quotes the case of a patient from whose stools at the beginning of the illness an agglutinating cholera vibrio was isolated and in whose gall bladder at the post-mortem three weeks later an inagglutinable strain was found; a similar case was reported by CENDIRAPOULO.

H. S.

FROUIN (Albert) & ROUDSKY (D.). **Action bactéricide et antitoxique des Sels de Lanthane et de Thorium sur le Vibrion Cholerique. Action Thérapeutique de ces Sels dans le Choléra Expérimental.**—*C. R. Acad. Sci.* 1914. Aug. 10. Vol. 159. No. 6. pp. 410–413.

Animal experiments to demonstrate the value of thorium and lanthanum sulphate in the therapy of cholera. Both salts were given by the mouth with no ill effects (1) to two dogs of 12 and 6½ kilo respectively—4 gm. a day for 20 days, (2) to the authors themselves in doses of 4 gm. a day for two days. Ten cc. of a living cholera emulsion, of which 2 cc. given intraperitoneally proved fatal to guinea-pigs in eight hours, were mixed with an equal quantity of 1 or 2 per cent. lanthanum sulphate solution and after standing 30 minutes centrifuged, the deposit being resuspended in 10 cc. saline. Of ten guinea-pigs given 4 cc. (double the dose of untreated emulsion fatal in 8 hours) of this treated emulsion intraperitoneally all survived. Of 10 given 7 cc. two survived and eight died in 24-36 hours. Using an emulsion similarly treated with 1 or 2 per cent. thorium sulphate, of ten guinea-pigs given 4 cc. doses and the same number receiving 7 cc. all survived. These experiments were repeated three times with three different cholera strains. Of four monkeys prepared by the method of POTTEVIN and VIOLLE (a preliminary purging dose of 7–9 gm. of sodium sulphate) and given a Petri dish cholera culture emulsified in 20 cc. broth one died in 30–44 hours, but when six hours after the bacterial emulsion they received by the mouth 40 cc. of a 2 per cent. thorium or lanthanum sulphate solution they survived and suffered no ill effects. If they received twelve hours before 50 cc. of (1) a 2 per cent. thorium sulphate solution death still did not take place (2 animals), (2) a 2 per cent. lanthanum sulphate solution death ensued in 38 and 44 hours (2 animals).

The control monkeys which received no salt solution were given corresponding amounts of water, so that the total amount of liquid should in all cases be the same.

H. S.

CASTELLANI (Aldo). **Note on a Vibrio (*Vibrio Kegallensis* Cast., 1913) isolated from Cases of Paracholera.**—*Jl. Trop. Med. & Hyg.* 1915. Apr. 15. Vol. 18. No. 8. pp. 85-87.

The three strains of a cholera-like vibrio, one recovered from well water, two from stools of what looked like cholera cases, no other vibrio however being isolated, gave practically all the cultural tests of *V. cholerae*, but differed in agglutinating properties, not clumping with true cholera serum and producing a serum which does not

agglutinate the Koch bacillus. Although unable to demonstrate any pathogenicity in monkeys and rabbits, the author suggests this vibrio may be the cause of cholera-like disease.

H. S.

DÉMÉTRESCU (C. A.). **Action des endotoxines typhique et cholérique sur les Capsules Surrénales.**—*C. R. Soc. Biol.* 1915. Jan. 8. Vol. 77. No. 33. pp. 591–592.

By injecting subcutaneously into rabbits 24 hours cholera cultures killed at 60° C., the action of the endotoxin on the suprarenal capsules and in particular on the chromaffin substance was tested. In almost all the nine rabbits that the author employed, a complete disappearance of the chromaffin substance resulted; many cells were vacuolated and sometimes the nuclei degenerated. An extract prepared from the suprarenal capsules of inoculated animals contains little or no adrenalin, as evidenced by there being only a slight or even no rise in blood pressure on injecting intravenously into rabbits; the Ehrmann-Meltzer pupillar reaction in the frog's eye is not given, nor is the colour reaction with phosphomolybdic acid.

H. S.

VIOLLE (H.). **Essais sur la Pathogénie du Choléra.**—*Ann. Inst. Pasteur.* 1914. Aug. Vol. 28. No. 8. pp. 759–770. With 2 figs.

On giving a fatal intravenous dose of cholera broth to a rabbit the author noticed that the vibrio could be recovered from the small intestine and that the mucous membrane there showed signs of congestion, particularly below the entrance of the pancreatic duct, which in the rabbit enters about 20–30 centimetres below the pylorus. Scrapings from the surface of the small intestine show everywhere the vibrio but, while above the caruncle of the pancreatic duct there are few, below that point there are many. In the rabbit the entrance of the pancreatic duct is some 20–30 centimetres from that of the bile duct. It is thus possible to suppress either of these two secretions separately if required, tying the pancreatic duct and cauterising the gland to prevent absorbtion by the blood in the one case and tying the bile duct in the other. It was found that with the pancreatic secretion suppressed, unaltered or stimulated, in no case could death from cholera be induced on injecting vibrios into the small intestine either above or below the pancreatic caruncle, and that a similar negative result was obtained with the bile duct tied if the vibrios were inoculated a few centimetres below the pylorus, but on the other hand if inoculation took place just below the entrance of the pancreatic duct, the animal succumbed rapidly to typical cholera. Only small amounts of broth cultures were needed, as little as $\frac{1}{4}$ cc. per kilo animal.

The authors earched for a drug to suppress the secretion of the bile but could find nothing capable of doing that except the cholera toxin itself. Given a small, non-fatal amount intravenously, animals then, when further vibrios have been injected into the small intestine below the pancreatic caruncle, develop the disease. The author sees here

an explanation of the mode of attack. Vibrios on being swallowed reach the subpancreatic portion of the small intestine and there, owing to some temporary cessation or lessening of the flow of bile, multiply to some extent; the absorbed toxins still further check the liver secretion and the vibrios invade the whole intestine causing death. He was however unable to induce the disease in rabbits by giving the vibrios per os, after the bile duct had been tied. That bile should *in vitro* be a good medium for cholera vibrios and in the intestine so inimical to them, the author does not regard as remarkable; the action of bile on the mucous membrane, its vessels, cells, glands and nerve endings, and its effect on the other ferments and the bacterial flora in general must be taken into account. The conditions favouring the contraction of the disease the author considers to be: (1) to have the bile and pancreatic ducts situate high up in the intestine; (2) to have a discontinuous flow of bile.

In man these are fulfilled; the deciding factors therefore reside not in the tissues or fluids of the body, but in the anatomy of the digestive glands and their method of secretion.

H. S.

MERELLI (L.). **Variazioni biologiche del vibrione colerigeno.** [Biological Variations in the Cholera Vibrio.]—*Pathologica.* 1915. Apr. 15. Vol. 7. No. 155. pp. 179–183.

A number of cholera strains isolated from carriers and patients in 1911 and kept alive for three years by subculturing every one or two months on ordinary agar were found at the end of that period to have remained, beyond the loss of virulence which was easily restored by passage through guinea-pigs, unchanged morphologically, culturally and biologically, except in the case of one strain, which after three years of cultivation, no longer agglutinated with cholera serum, did not give Pfeiffer's test and on injection into animals did not produce a serum which would agglutinate typical vibrios, although much auto-agglutinin was present, nor give the complement fixation test with typical vibrios. On the other hand complement was deviated when a true cholera serum and this altered vibrio were used, thus showing the true nature of the organism in question and the importance of the complement fixation test for establishing group relationships. This spontaneously altered cholera vibrio had in 1912 been subjected to attempts to induce variation artificially but without success.

H. S.

LIPP (Hans). **Das Blutbild bei Typhus- und Choleraschutzimpfung.** [The Blood Cells after Typhoid and Cholera Inoculation.]—*München. Med. Woch.* 1915. Apr. 20. Vol. 62. No. 16. pp. 539–541.

Twelve individuals were examined after inoculation with cholera vaccine. The blood was taken during the morning to avoid confusion with the leucocytosis of digestion. Examination was carried out on the day before, and the first three days after the inoculation, which took place at 5 p.m. and was, as a rule, repeated once and after an

interval of eight days. Little change, with the exception of a slight leucocytosis, is observed in the blood cells. The neutrophile cells sink in some cases from the normal 70–72 per cent. to about 60 per cent., while the eosinophiles rise from the normal 3 or 4 per cent. to 10 or 15 per cent., but soon after the second inoculation the numbers are normal again. In one case, with fever, a more marked leucocytosis was observed (19,000 leucocytes per cmm). the neutrophiles rising to 90 per cent. and the lymphocytes falling from the normal 20–25 per cent. to 3–4 per cent. The author considers this slight leucocytosis after inoculation to correspond with the "negative phase." [Judging from the three cases where actual figures are given, there seems to be a considerable individual variation in responding to inoculation and it is not clear, for instance, whether the neutrophiles rise or sink in numbers after inoculation with cholera.]

H. S.

LENTZ (Otto). **Bereitung des Dieudonné-Agars mit Hilfe eines Blutalkali-Trockenpulvers.** [The Preparation of Dieudonné's Agar with Blood-Alkali Powder.]—*Deut. Med. Woch.* 1915. Apr. 8. Vol. 41. No. 15. pp. 425–426.

Finding that dried Dieudonné blood-agar (three different preparations tried) gave bad results and concluding that this was probably owing to the binding of the free alkali by the serum proteins of the medium, a gradual process which was no doubt hastened by the preparations being supplied in paper wrappings and being thus accessible to moisture, the author tried the effect of drying the blood alkali mixture apart from the agar.

Fresh, defibrinated ox blood was mixed with an equal quantity of normal potash and placed in a steam bath for half an hour. The liquid was evaporated in the shallow trays of a Faust-Heim apparatus under an air current of 37° C., the residue being ground to a powder and kept in a well stoppered glass bottle. Three grams of powder dissolved in 30 cc. water and added to 70 cc. neutral agar gave a Dieudonné blood agar which was ready for immediate use, would keep for 8–10 days and had all the elective properties of the normally prepared Dieudonné medium. The powder was retested after four weeks and found to give as good a medium as when freshly prepared.

H. S.

VIOLLE (H.). **Sur un nouveau milieu de culture de séparation pour le vibrion Cholérique (Milieu sodo-glycériné).** —*Bull. Soc. Path. Exot.* 1915. Feb. Vol. 8. No. 2. pp. 52–54.

The author prefers for the isolation of cholera vibrios the following medium to Dieudonné's blood agar :—

Nutrient Agar	87
Glycerine	10
Normal soda	3

because it is more easily prepared, ready for immediate use, keeps longer and is transparent, permitting one to distinguish the cholera colonies as small, transparent, slightly raised and rounded, pinhead

growths. Although the vibrios on this medium are shorter, plumper and less motile, they are still easily recognisable and retain their staining properties. By substituting a similar quantity of 2 per cent. peptone water for the nutrient agar an equally good liquid medium is obtained.

H. S.

McMillan (John Furse). **Asiatic Cholera.**—*Jl. Trop. Med. & Hyg.* 1914. Dec. 1. Vol. 17. No. 23. pp. 354–363.

A somewhat inadequate historical account of the disease with observations from the author's own experience, containing a translation from Thucydides on a "Pestilence" at Athens, which the author considers to have been a cholera epidemic.

H. S.

Salimbeni (A. T.). **Recherches sur la vaccination préventive contre le choléra asiatique.**—*Bull. Soc. Path. Exot.* 1915. Jan. Vol. 8. No. 1. pp. 17–22.

A comparison of the sera of 27 cholera convalescents and 31 individuals inoculated with cholera vaccine. Serum was taken from the cholera patients at different times up to the 88th day after the disappearance of the disease; from the inoculated (three doses of a killed emulsion being given with intervals of five days) from the 5th to the 221st day after the third dose.

In no case was any trace of an antitoxin found. On six occasions serum was tested during the course of the disease or immediately afterwards and found to be completely inactive in respect of agglutinating properties and protective power, the author concluding that recovery takes place without the setting free of antibodies into the blood stream. Only after the 6th, 8th or even 15th day of convalescence does the serum become agglutinative, reaching in the 3rd and 4th weeks its maximum titre of 1/150–1/450, which in two cases that were particularly followed was not lowered even after the 72nd and 88th day. In four cases the titre continued to rise for five weeks and went as high as 1/900–1/2500. Taking into account an observation of Violle's that rabbits inoculated in the gall-bladder with cholera vibrios showed a titre as high as 1/10,000, and the knowledge that the vibrio may in man become localized in the biliary passages, the author thinks these high titres obtaining in his convalescents might point to the persistence of the organism in the bile ducts.

In the inoculated agglutinins were always found by the 5th day after the third dose; the maximum was reached between the 12th and 15th day, and the titre began to sink again after two months. In four cases examined during the fourth month the titres were 1/50–1/255, in one case after 186 days it was 1/75, another proved inactive after 204 days, while yet another after 221 days gave a titre of 1/250. In all cases, both convalescents and inoculated, the blood possessed protective properties against intraperitoneal injection of the vibrio into guinea-pigs. By the present laboratory methods there is no way of distinguishing between the serum of a convalescent and that of an inoculated person.

H. S.

SAVAS (C.). **La Dernière Épidémie de Choléra en Grèce (1913) et la Vaccination anticholérique.**—*Bull. Office Intern. d'Hyg. Publique.* 1914. Oct. Vol. 6. No. 10. pp. 1653–1672.

A full account of the prophylactic cholera campaign carried out in Greece on a large scale during the Balkan war of 1913. Early in March, before cases had occurred in Greece, inoculation was commenced; about the middle of May the Greek army and the inhabitants of that part of the country which they occupied were infected by Greek refugees, coming from regions where fighting and cholera were already rampant. In June Greece went to war. By the end of June the inoculation of the army was complete and the number of cases of cholera sensibly diminished. The epidemic was over by the end of October. The army was provided with cholera ambulances, each one consisting of a mobile detachment (travelling laboratory and disinfecting corps) and a more stationary one (for the transport and treatment of cases). In the spreading of the disease the chief factors were contact with infected persons, and flies; against the latter no measures could be taken during the campaign. In the isolation hospitals both soldiers and civilians were brought together. Between 5,200 and 5,300 cases in all were treated in hospital with between 1,165 and 1,700 deaths, roughly a case mortality of from 22 to 32 per cent.

KOLLE's method of preparing a vaccine was followed. A recently isolated virulent strain, which was typical in every respect, including agglutination and complement fixation, was taken; its virulence was still further raised and kept raised by repeated passage through guinea-pigs. Grown on agar the culture was emulsified in physiological saline so that 1 cc. = 4 mg. vibrios, and killed at 50° C., ·5 per cent. phenol being added subsequently. Dosage was ·1 cc. under 1 year of age, ·2 cc. for 1–3, ·3 cc. for 3–5, ·5 cc. for over 10. After eight days double the amount was given, which completed the treatment. All persons with a raised temperature, or serious heart or kidney trouble and the newly born were exempted. In all about 500,000 were inoculated. In some cases within a day or two of injection the inoculated developed fulminating cholera and died. The author suggests that this points to the existence of a negative phase. [It may well be that in these cases inoculation took place during the incubation period.]

It was found that inoculation did not interfere with the fighting capacity of the troops, but on the contrary, owing to their faith in the efficacy of the measure, it raised their morale considerably. In eleven divisions of the army inoculation was carried out to the following extent and with the following disease incidence occurring: 14,613 inoculated once, 4·2 per cent. developed the disease; 91,224 inoculated twice, ·7 per cent. developed the disease; 8,968 not inoculated, 9·3 per cent. developed the disease. The mortality figures of the anticholera ambulances and the hospitals in Salonika were as follows: among 433 inoculated once, 12·2 per cent.; among 376 inoculated twice, 10·2 per cent.; among 1,113 not inoculated at all 27·5 per cent.

With regard to the treatment of cases with anticholera serum opinion was divided, but on the whole it was decided that there was little result from its employment. From the use of iodine no benefit was observed.

H. S.

DOPTER (Ch.) **La Prévention du Choléra par les Vaccinations anticholériques.**—*Ann. d'Hyg. et Méd. Légale.* 1915. Feb. Vol. 23. pp. 65–67.

A plea for preventive cholera inoculation, with a few statistics and data gained from the Greek cholera inoculation campaign during the Balkan war of 1913, which has been reported on more fully above.

H. S.

VINCENT (H.). **Sur la Vaccination expérimentale contre le vibrion du choléra par la vaccin sterilisé par l'Ether.**—*C. R. Acad. Sci.* 1915. Mar. 22. Vol. 160. No. 12. pp. 378–380.

Cholera cultures (24 hours on agar at 38° C.) are emulsified in physiological saline and shaken with ether, giving a somewhat thick and whitish supernatant fluid which is poured away leaving a sterile and translucent underlying liquid, the vaccine. Guinea-pigs immunised with a vaccine of this kind withstand a subsequent lethal intraperitoneal dose of vibrios better than if a vaccine killed by heating to 56° C. for one hour were used. The comparison is based apparently on an experiment on one guinea-pig inoculated with a heated vaccine. The author summarises the advantages of a vaccine sterilised by ether as follows :—

1. Sterilisation is almost immediate.

2. Useless lipoid substances are extracted with the result that the vaccine is less toxic.

3. The vibrios are broken up which favours bacteriolysis *in vitro* and a rapid resorption *in vivo*; thus antibody formation is quickly set up, a matter of importance in a disease which like cholera has a short incubation period.

4. A general method for preparing bacterial vaccines is established, vaccines which, while possessing the advantages of living ones, are not accompanied by the danger usually attached to their use.

H. S.

BUIWID (O.) & ARZT (L.). **Ueber Choleraschutzimpfung (Bisherige Beobachtungen über die Beeinflussung der Morbidität und Mortalität als Folge der Vakzination.** [On Prophylactic Cholera Inoculation.] —*Wien. Klin. Woch.* 1915. Feb. 18. Vol. 28. No. 7. pp. 172–175.

A consideration of the case mortality and degree of severity of attack in inoculated soldiers who acquired cholera round Cracow

chiefly during November and December of last year. The following table of the author summarises the observations :—

Number of cases.	Divided among different corps.	The attack was			
		light in	medium in	severe in	fatal in
63	39	28=44·5%	6=9·5%	25=39·7%	4=6·3%

Of these 63 cases 16 were inoculated less than a week before the onset of the illness and consisted of 9 light, 2 medium and 5 severe cases, with no deaths, which would suggest the absence of a negative phase.

The mortality among the uninoculated troops was over 30 per cent. No figures were available for a comparison of the incidence among the inoculated and uninoculated.

H. S.

AMOEBIASIS AND DYSENTERY.

Amoebiasis.

Sellards (Andrew Watson) & Baetjer (Walter Albert). **The Recognition of Atypical Forms of Intestinal Amoebiasis.**—*Bull. Johns Hopkins Hosp.* 1915. Feb. Vol. 26. No. 288. pp. 45–52. With 1 plate.

This paper contains an interesting account of three obscure cases of dysentery and diarrhoea occurring in Baltimore last winter (1914–15). The cases are of interest from the fact that they presented variations from the usual chronic form of amoebic infection and, as the authors remark, "in looking for unusual types of chronic infection it is conceivable that these might occur, not primarily in the tropics where the optimal conditions prevail for the development and propagation of the disease, but rather in the North where the disease must maintain itself under unusual and adverse conditions." In the three cases observed, the general health of the patient was comparatively good and the principal symptom was the annoyance of frequent stools. The disease in each case ran a *continuous* course over a period of several years *free from any intermission* or remission of symptoms. Stools were usually frequent, contained much water and but little or no blood and mucus. Microscopical examination of the excreta sometimes showed amoebae but the characteristic *Entamoeba histolytica* was absent. The amoebae did not disappear after the injection of emetine nor did the symptoms yield to this drug. The clinical histories of the patients presented few points in common with amoebic dysentery. In two of them, however, there had been in the early days of the disease a history of definite dysentery. Also while one of the patients was under observation periods frequently occurred in which a considerable quantity of blood appeared in the stools but in the intervals watery diarrhoea only prevailed. In such cases, as the authors admit, it is of extreme importance to identify the species, while absolutely accepting, as the authors do, the view that there are but two parasitic amoebae of man one of which, *E. histolytica*, is pathogenic and the other, *E. coli*, non-pathogenic.

Case I.—Typical dysentery with bloody mucous stools, 10 or 12 years ago in Egypt. Probably intermissions during early years of the malady but in past few years no intermission. Up to 20 stools per day—watery and containing no blood and no mucus. Amoebae in stools very scarce, of small size and sluggishly motile. Cytoplasm somewhat hyaline and no differentiation of ectosarc from endosarc. No included red cells (no blood in stools). Nucleus easily seen and richer in chromatin than either *E. histolytica* or *E. coli*. The chromatin was arranged in rather large irregular masses. *Cyst-like bodies found with* 1, 2 and 3 *nuclei* and only after long search was one found with 4 nuclei. These gross differences between the amoebae found and *E. histolytica* did not justify a diagnosis of amoebic dysentery without further investigation as to their pathogenic action. *Cultivation on various media failed.* Faecal material (rich in flagellates but containing not more than 1 or 2 vegetative amoebae in a coverslip preparation and no 4-nuclei cysts, though cyst-like bodies with 1, 2 and 3 nuclei were abundant) was injected into a kitten in three localities, viz. directly into caecum, into ileum (1 foot above ileo-caecal valve) and into stomach (6 cc. in each locality). No amoebae or flagellates appeared in the stools during the next few weeks and no clinical symptoms.

In the 5th week frequent loose stools were passed containing a few motile amoebae. Cultures negative. No blood or mucus in stools. General health of animal unimpaired . The amoebae in the kitten's excreta were slightly larger and more active than those in the patient and there was some differentiation between ectosarc and endosarc. Nucleus was poorer in chromatin but still richer than *E. histolytica* or *E. coli*. Cysts with 4 nuclei not uncommon and occasionally cysts with 5 or 6 nuclei. After two months diarrhoea diminished and amoebae became less numerous. The animal was killed but, apart from a few hyperaemic areas, there were no definite lesions in large bowel. Material from this kitten at autopsy was injected into two young kittens. Both showed signs of infection after 5 days and 10 days incubation respectively. The one kitten died from some unknown cause on the 6th day. Its large bowel showed a moderate degree of hyperaemia. Amoebae were abundant in the bowel contents and in character they approached the *E. histolytica* type. The other animal died three weeks after inoculation. The small bowel was intensely injected in the lower half of ileum, the hyperaemia ending sharply at the ileo-caecal valve. Contents of large bowel were seropurulent and many amoebae were present. These were smaller than the parasitic forms but resembled *E. histolytica* more closely than the original forms in the patient.

Case II.—Boy of 14 years. Nine and a half years ago he contracted diarrhoea which lasted only a few weeks. A year later it returned, 3–5 stools being passed per day with occasional discharge of blood. The latter disappeared and since that time the diarrhoea persisted in a watery form. Emetin and ipecacuanha of no benefit. Chaparro amargosa tried but discontinued owing to nausea. The amoebae intermediate in character between *E. coli* and *E. histolytica*, but the comparative richness of the nucleus in chromatin would not permit a definite diagnosis of *E. histolytica*. A kitten inoculated with faecal material developed after three days a sharp dysentery with blood and mucus. It recovered before satisfactory specimens could be obtained for study.

Case III.—No definite history of amoebic dysentery, but frequent attacks of diarrhoea. During past 18 months, diarrhoea constantly present. Emetin and ipecac. of little benefit. No trophozoites found but scrapings from the ulcers (rectoscopic examination) showed cyst-like bodies with 1–3 nuclei. No 4-nuclear forms. An inoculated kitten developed after one month's incubation a watery diarrhoea like that of the patient. Amoebae abundant and not differing essentially from those seen in first passage from Case I. Symptoms persisted in kitten for one and a half months, and then became much milder. After two months the animal was killed. No lesions found.

The authors conclude that the amoebae from these cases are pathogenic for kittens and, in the absence of other adequate causes in explanation of the diarrhoea, were aetiological factors in producing the symptoms in the cases described. In the author's opinion the virulence and other biological characters of *E. histolytica* are subject to some variation and with changes in environment morphological changes may also occur. These variations occur both in the trophozoites and in the encysted stage. Features such as the amount of chromatin and its arrangement in the nucleus are not absolutely fixed characters but are subject to more variation than has been suspected. A more surprising phenomenon is the liability to variation in the number of nuclei in the cysts. The observation of HARTMANN that *E. histolytica* when infecting lower animals undergoes definite morphological changes offers further evidence in support of the view that the atypical strains described have developed from *E. histolytica*. By passage these atypical forms tended to return to the *histolytica* type.

An excellent plate accompanies this paper.

J. C. G. Ledingham.

DEBUYS (L. R.). **Amebic Dysentery in Children.**—*Amer. Jl. Obstet.* 1914. Sept. Vol. 70. No. 441. p. 509.

Amoebic dysentery is not considered common amongst children because they are less exposed to the predisposing factors than are adults. It is however commoner than is believed, especially in New Orleans. In the Children's Hospital four cases in children were found in a series of 3,000 [see this *Bulletin*, Vol. 5, p. 202.]

P. H. Bahr.

JONES (Glenn I.). **The Treatment of Intestinal Amebiasis.**—*Jl. Amer. Med. Assoc.* 1915. Mar. 20. Vol. 64. No. 12. pp. 982–983.

A brief paper, pointing out that though emetin is one of the most valuable agents in the treatment of intestinal amoebiasis hypodermics of emetine alone will not cure amoebic dysentery. The author had an experience of 50 cases in the Philippines and came to the conclusion that most cases of amoebiasis can be cured by administration of emetin hypodermically, accompanied or followed by ipecacuanha given orally. Ipecac alone, like emetin alone, will not prevent relapses. The author unfortunately does not classify his 50 cases into two groups according as single or combined treatment was employed. At the Department Hospital, Manila, the following is the routine treatment: emetin hydrochloride 0·008 gm. hypodermically for 10 days (twice a day for four days and once a day for six days). Ipecac is given about the 8th day, 1·5 gm.–2 gm. doses at bed time continued for three consecutive nights and thereafter decreased by 0·3 gm. each consecutive night. The administration of ipecac. should be preceded by Tinct. opii in doses of 0·6–1 gm. In the author's view it should always be borne in mind that emetin is an amoebacide and has little to do with the healing of ulcerations. Every case after this treatment should be regarded as one of ulcerative colitis and suitable dietetic measures should be taken.

J. C. G. L.

van den BRANDEN (F.) & DUBOIS (A.). **L'Amibiase et son traitement par l'Emétine à l'Hôpital des Noirs, Léopoldville, Congo Belge.**—*Bull. Soc. Path. Exot.* 1915. May. Vol. 8. No. 5. pp. 332–338.

Amoebic dysentery is far from rare at Leopoldville in the Belgian Congo. The mortality is high among chronic hospital cases and the use of emetin has not diminished the incidence though it has considerably reduced the mortality. The authors studied 41 cases, including one which was complicated by abscess of the liver. When they commenced the use of emetin, they gave it subcutaneously in doses of 0·02 gm.-0·10 gm. per day. Later they gave the drug intravenously, 0·10 gm. per day dissolved in 10 cc. of saline. It was well tolerated and caused no irritation of the kidneys. The intravenous injections acted more promptly and energetically than the subcutaneous injections. They were moreover not painful and accordingly were more readily tolerated by the blacks. The following figures indicate the reduction in mortality since the introduction of emetin: 1911, 60 per cent.; 1912, 53 per cent.; 1913 (emetin) 15 per cent.; 1914, 17 per cent. Notes of all 41 cases are given in tabular form with doses employed and mode of administration.

J. C. G. L.

NIXON (P. I.). **Chaparro Amargosa in the Treatment of Amoebic Dysentery.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Mar. Vol. 2. No. 9. pp. 572–584.

The author believes that Chaparro amargosa is the most efficient remedy we have at present for the treatment of amoebic dysentery, with the possible exception of emetine. It was introduced by J. W. NIXON of Gonzales, Texas, in 1893 as an antidysenteric remedy and the drug is on the market as a fluid extract, the dose being 1–3 fluid drams before meals. Nixon employs an infusion prepared by boiling for 30–60 mins. the roots, branches, foliage and fruit of the plant, which is indigenous to south-west Texas and north Mexico. His routine treatment is as follows :—The patient is kept in bed, if possible, on diet restricted to liquid or semi-liquid food. One oz. of mag. sulph. is given three or four hours before treatment is begun and repeated every 3–4 days. Six or eight ounces of the infusion are given by the mouth half an hour before each meal. Rectal enemata of 500–2,000 cc. are also given in the knee-chest position twice a day and the patient is instructed to maintain the position for 5 or 10 minutes and afterwards to retain the fluid as long as possible. The treatment is continued for a week or two after the subsidence of all symptoms. The infusion has a very bitter taste which is easily overcome by eating a piece of bread or drinking a little coffee. No nausea has followed its administration. In ordinary diarrhoea the drug is not indicated and it is without action on other intestinal parasites (1 case of Strongyloides, 1 of *Balantidium coli* and 3 of *Cercomonas intestinalis*). Data concerning 12 cases treated by this drug are given. The symptoms ceased immediately in all cases. One case disappeared from observation after three months, one case was well for 10 weeks, one for 3 months, two for 1 year, one for 2 years and five for more than 2 years. There was one recurrence in a case insufficiently treated. No liver abscess or other complications.

J. C. G. L.

MINK (O. J.). **Salvarsan in a Case of Amebic Dysentery.**—*U. S. Naval Med. Bull.* 1914. Oct. Vol. 8. No. 4. pp. 653–654.

The patient contracted dysentery in Nicaragua in September 1912 and received all the usual treatments including appendicostomy. During past three months, amoebae still active in stools in spite of vigorous treatment with emetin, ipecacuanha and quinine irrigations. On July 9th, 1914 the patient received 0·6 gm. salvarsan intravenously and on July 18th passed the first solid stool for five months. Stools continued solid and no amoebae appeared after vigorous saline catharsis. The improvement after salvarsan was apparently very rapid and marked. [It would be of interest to know whether the patient had also syphilis.]

J. C. G. L.

RAZETTI (L.). **El Metodo de Rogers en la Amibiosis hepatica. Observaciones de dos abcesos hépaticos curados con la emetina.** [Two Cases of Hepatic Abscess cured with Emetine.]—*Gaceta Med. de Caracas.* 1915. Jan. 15. Vol. 22. No. 1. pp. 6–7. With 1 chart.

Two cases of liver abscess in which the author was able to dispense

with any open operation, the pus being merely drawn off with the large trocar of a Potain's aspirator. The cavity was then filled through the same trocar with about 100 cc. of physiological salt solution containing 10 centigrammes of hydrochlorate of emetin in solution. An anaesthetic is not needed for this operation, the puncture being closed with a pad of gauze and collodion. The author remarks that the treatment of liver abscess is thus brought within the reach of every general practitioner. In the first case two aspirations were necessary, and in the second only one, the entire treatment in the latter case only occupying 16 days. The usual hypodermic injections of emetin were given in addition.

J. B. Nias.

STRINE (H. F.). **Emetin in the Treatment of Amebic Abscess of the Liver.**—*U. S. Naval Med. Bull.* 1914. Oct. Vol. 8. No. 4. p. 653.

Dysentery was contracted in October 1913. Treatment for six weeks with emetin 1/3 gr. ter die. In May 1914 the patient enlisted in the U.S. Navy while in excellent health. In July 1914 he was admitted to hospital. No amoebae in stools; right lobe of liver enlarged. On July 12th 200 cc. of pus were evacuated from an abscess. Amoebae were not demonstrated in the pus.

J. C. G. L.

PASLEY (Claude Burgoyne). **Two Extraordinary Cases of Liver Abscess.** —*Lancet.* 1915. May 22 pp. 1076–1077. With 3 figs.

The author records two cases of liver abscess which were remarkable for their enormous size, both practically filling the abdominal cavity. There was no jaundice in either case and both made a successful recovery after evacuation of the absce s cavities. In the author's opinion no case of liver abscess however large, or however ill their possessors may be, need be considered hopeless.

J. C. G. L.

WALTON (H. J.). **A Case of Urinary Amoebiasis.**—*Brit. Med. Jl.* 1915. May 15. pp. 844–845.

The writer, who is Professor of Pathology at Lucknow, commences with a reference to the few published cases of this rare and interesting condition. BAELZ's case occurred in a Japanese woman, entamoebae being found both in the bladder and in the vagina and BAELZ was of opinion that the parasites were introduced into the vulva with the water used for washing the parts, thence penetrating into bladder and vagina. The amoebae in this case were very motile and had a diameter of about 50μ. It was not stated whether the parasites contained red cells though the urine was described as sanguineous*. Walton's own case was briefly as follows :—Male 18, Brahmin, admitted to Hospital, Lucknow, 12th May, 1914. Had been suffering from hematuria for six months and from anasarca of the legs, penis and scrotum for three weeks. Small superficial ulcer on glans penis with

* See also this *Bulletin*, Vol. 5. p. 200.

slight sero-sanguineous discharge. No treponemata found. Inguinal glands not enlarged. Stools healthy and no entamoebae found. Patient stated that he had never suffered from dysentery. Urine scanty and deeply blood stained, acid, Sp. Gr. 1013. Much albumin, pus, red cells, and hyaline and granular casts. Also numerous actively motile entamoebae.

Emetine was given in $\frac{1}{2}$ grain doses twice a day hypodermically. In 48 hours, the amoebae were much diminished in numbers and more sluggish. On the third day the urine was much clearer and not tinged with blood; reaction alkaline, little albumin and no active amoebae seen. On May 17th, there were no amoebae in the urine and emetine was discontinued. Patient felt much better. On May 21st, the swelling of the legs had gone though that of penis continued. The sore had healed. The stools were examined almost every day and no entamoebae were found in them till June 5th when a few sluggishly motile entamoebae, which seemed to be *E. tetragena*, were detected. At this time there were no amoebae in the urine. The administration of emetine was resumed and the entamoebae disappeared from the stools within two days. The patient was still under treatment. Urine was free from blood and no amoebae had been found in it since they disappeared on May 17th nor had amoebae been observed again in the stools.

With regard to the characters of the amoebae found in the urine, "they were specially characterised by their active motility and by the unusual persistence of motion in one direction. As a rule, a single hyaline lobose pseudopodium was protruded in the direction in which the amoeba was travelling; as soon as the granular endoplasm had flowed into it a fresh ectoplasmic pseudopodium appeared at the same place. In this respect the entamoebae differed from the ordinary forms of *E. tetragena* and *E. coli*, which frequently produce pseudopodia simultaneously at different parts of their surface, and often alter the direction of their motion."

Spherical or oval resting forms were also seen, varying in diameter from 25–35μ. The cytoplasm in both the active and resting stages was coarsely granular with numerous vacuoles. Nearly all the amoebae contained red cells (10 on the average). No included bacteria and no free bacteria present in the urine. No distinction in active amoebae between ectoplasm and endoplasm except in the pseudopodia. Owing to the great activity of the amoebae and persistence of motion in one direction, they generally assumed a narrow elongated form attaining a length of 50–60μ with a breadth of 10–20μ. In most of the living active amoebae no nucleus was discernible. In a few however, a spherical nucleus about 4μ in diameter could be seen. In preparations fixed in Schaudinn's solution and stained by iron-alum-haematoxylin, the cytoplasm was very vacuolated and there was no definite nuclear membrane. In some cases much chromatin was collected at the periphery of the nucleus. Fixed specimens measured 18μ–35μ. Infection experiment was tried in one kitten, 4 oz. of urine being injected per anum as far up the colon as possible. The kitten did not become infected. Cultivation on Musgrave and Clegg's medium also failed.

Encysted forms were found neither in the urine nor in the stools. The writer considered it impossible to be quite sure of the species of entamoeba concerned but in all probability it was identical with *E. tetragena*. The mode of access of the amoebae to the urinary tract

appeared to be fairly obvious. Entamoebae were present in the stools (otherwise normal) on two consecutive days and their characters agreed with those of *E. tetragena*. As it is customary among the Indians to wash the anus and perineum with water after defaecation it is easy to understand a transference to the urethra. Perhaps an abnormal condition of the urine is necessary to enable the amoebae to establish themselves. Chronic nephritis (as in this case) is common enough in India as also intestinal amoebiasis. Consequently opportunities for infection of the urinary tract must be frequent and possibly urinary amoebiasis is commoner among Indians and other Asiatic races than is generally supposed.

J. C. G. L.

COURET (Maurice). **A Study upon Amoebae cultivated from the Normal Human Intestine.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Jan. Vol. 2. No. 7. pp. 450–464. With 1 plate.

In this paper the author records the results of his experiments with free living amoebae, cultivated from the intestines of healthy human subjects and of lower animals, and from external sources. The indications are that such amoebae may be propagated in the tissues of man or of lower animals when symbiotic bacteria are present.

Faeces of 200 apparently non-dysenteric persons were examined before and after the administration of a mild laxative; those examined included inmates of the Charity Hospital, New Orleans, students of Tulane University, and others; amoebae in various stages were found in 41 cases. Of those able to be observed for two to four months none showed clinical evidence of intestinal "upsets."

Attempts were made to cultivate the amoebae obtained on various media. The organisms approximated to: *Amoeba fecalis*, Walker; *A. cobayae* and *A. musculi*, Walker; *A. intestinalis* and *A. gallfavoris*, Walker; *A. hominis*, Walker; *A. lobosa guttula* and *A. diaphana*, Celli and Fiocca.

Experiments were made on animals to determine whether the amoebae produced lesions or were harmless commensals. The cultures were started from one amoeba. When a symbiont was required, it was chosen from those organisms best suited to the parasite.

"The experiments were divided into seven groups:—

"*Group I.*—The animals were fed on cultures of one species of amoeba in sterile milk and water.

"*Group II.*—Animals were given a mixture of several species of amoebae and their original symbiotic organisms, in milk and water.

"*Group III.*—Animals received high rectal injections of suspensions of several species of amoeba with one or more symbiotic micro-organisms. The symbiont was chosen from bacteria most likely to produce lesions.

"*Group IV.*—Animals were injected into the liver with a single species of amoeba in symbiosis with *V. cholerae*, *B. typhosus*, *B. dysenteriae* or *B. coli*, alone or in combination with each other.

"*Group V.*—Animals injected into the liver with encysted amoebae free from symbiotic micro-organisms.

"*Group VI.*—Were first immunized against *B. cholerae* and subsequently, cultures of all species of amoebae in symbiosis with the cholera vibrio were injected into the liver.

"*Group VII.*—Animals injected with the bacteria alone used as symbionts to the amoebae."

The results of 16 experiments are detailed. Kittens, cats and monkeys were used.

The author concludes :—

"Free-living amoebae and amoebae cultivated from the healthy intestine cannot produce typical amoebic lesions in the gastro-intestinal canal or the liver of susceptible animals when introduced in pure cultures or with favourable bacterial symbiosis. When either one or several species of amoebae were fed to animals or injected into their rectum with bacterial associations, the results were negative unless the symbiotic micro-organism was capable of producing an intestinal upset. When pure cultures were used no results were obtained. Animals injected into the liver with suspensions of one or many species of amoebae either in pure culture or associated with some micro-organism, failed to show lesions when the bacteria were omitted or were not pathogenic. Positive results were obtained only when the bacterium in symbiosis was pathogenic to the host. In every instance, the lesions when present did not suggest amoebic invasion. Negative results followed when the amoebae and their symbionts were injected into the liver of an animal previously immunized against the bacterium, although lesions followed the injection of the same amoebae with the same symbiont, in an animal not protected against the symbiotic organism.

"Control animals that were fed or injected with the various bacteria used as symbionts, without the amoebae developed the same symptoms, died as frequently and the lesions were similar to those in which the amoebae were injected with the special microorganism."

H. B. Fantham.

KUENEN (W. A.). **Sur la Dysenterie amibienne.**—*Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal. Saigon* (1913). 1914. pp. 44–54. With 4 plates.

In this paper the author gives an interesting account of *Entamoeba coli* and *E. histolytica*. The morphology of these parasites is well illustrated in the four plates, containing over 80 figures.

For differential diagnosis of the entamoebae he recommends mixing fresh preparations of infected faeces with eosin or with methyl blue or with dilute tincture of iodine. The nuclei of the cysts are thus stained and can be counted.

The life-cycle of *E. histolytica* is divided into three stages :—The *histolytica* stage in the tissues, the saprozoic *minuta* stage, and the cysts. Emetine easily acts on the *histolytica* stage. The *minuta* and encysted stages occurring in the faeces are more resistant. In liver abscess the author only found *histolytica* forms.

H. B. F.

BASS (C. C.) & JOHNS (F. M.). **Pyorrhea dentalis and alveolaris. Specific Cause and Treatment.**—*Jl. Amer. Med. Assoc.* 1915. Feb. 13. Vol. 64. No. 7. pp. 553–558. With 9 figs.

The authors found pyorrhea dentalis and alveolaris very prevalent, 95 per cent. of the adults examined by them in New Orleans being infected. They have studied more than 300 cases. Pyorrhea dentalis is the name given to the early stage of the disease. They consider that *Endamoeba buccalis* is the cause of the pyorrhea. The endamoebas develop and live in the dead or dying tissue at the bottom of the lesions

or pockets. The amoebae vary in size, but are about that of *E. histolytica*. The ectoplasm is seen at the time of pseudopodia formation and the endoplasm contains granules resembling portions of red cells. Only a few endamoebae are present in the material from the surface, which consists chiefly of bacteria, spirochaetes and pus.

The authors have treated the disease with emetine, either administered hypodermically or internally by the mouth. In all ordinary cases half a grain of emetine hypodermically is the proper daily dose. They have also tried the use of a drop or two of fluid extract of ipecacuanha in half a glass of water for rinsing the mouth at night before retiring. For internal treatment by the mouth they recommend a commercial preparation of the alkaloids of ipecacuanha called Alcresta ipecac. Apparently this preparation contains hydrated aluminium silicate. Two or three tablets should be taken two or three times a day. The authors' summary is as follows :—

"1. Pyorrhea dentalis and alveolaris is practically a universal disease, which leads to the loss of the teeth by a long suppurating process. All people have it sooner or later. It begins in early adult life or earlier.

"2. The specific cause of the disease is *Endameba buccalis* and possibly other species, which infect and destroy the peridental membrane. The pyorrhea results largely from the secondary infection.

"3. The demonstrable endamebas can be destroyed by giving ½ grain of emetin hydrochlorid hypodermically for three to six successive days.

"4. Apparently equal endamebacidal effect is produced by two or three Alcresta ipecac tablets (Lilly) taken by mouth three times a day for four to six successive days.

"5. The lesions require variable lengths of time to heal, but many could not reasonably be expected to heal in less than several weeks or months.

"6. The treatment must be repeated from time to time until the lesions all heal, on account of relapse, or probably reinfection of the lesions as a result of the great prevalence of the infection.

"7. Injecting ipecac or emetin into the worst lesions ought to be of service and can be carried out by patients in many instances.

"8. Rinsing the mouth thoroughly with a solution of fluid-extract of ipecac is believed to protect, to some extent, against reinfection, and actually cures the disease in its earliest stage in some instances."

The paper is illustrated by seven photomicrographs and two diagrams.

[In an editorial on "Endamebas and pus pockets about the teeth" in the same journal (p. 593), it is remarked that "this disease should . . . be considered a pericementitis rather than an alveolitis."]

H. B. F.

SMITH (Allen J.), MIDDLETON (William S.) & BARRETT (M. T.). **The Tonsils as a Habitat of Oral Endamebas. Possibility of Systemic Complications of Oral Endamebiasis.**—*Jl. Amer. Med. Assoc.* 1914. Nov. 14. Vol. 63. No. 20. pp. 1746–1749.

The authors refer to the earlier work of SMITH and BARRETT indicating that the parasitic amoebae of the mouth "hold an important relation in the etiology of pyorrhea alveolaris or Riggs' disease," and that emetine is useful as an amoebacide in the disease. They consider that there is reason to suspect "an important symbiotic relation between the protozoa and the bacteria" of the mouth in the disease.

In the present paper they deal with the occurrence of endamoebae in the tonsils. Seventeen cases were examined, five of which showed motile amoebae of the type of *Endameba buccalis*. All the cases were suffering from chronic tonsilitis, usually with tonsilar hypertrophy. They also think that the amoebae may be connected with certain arthritic affections and certain obscure pernicious anaemias. The toxic states determining either the arthritides or the anaemias may possibly be due to the oral conditions. Emetine appeared to be of service in the treatment of these cases.

H. B. F.

Bacillary Dysentery.

Manteufel. **Untersuchungen über die Bazillenruhr in Deutsch-Ost-Afrika.** [Investigations on Bacillary Dysentery in German East Africa.]—*Zeitschr. f. Hyg. u. Infektionskr.* 1915. Jan. 15. Vol. 79. No. 2. pp. 319–335.

This communication deals with the bacteriology of an outbreak of bacillary dysentery in German East Africa at Dar-es-Salam. Dysentery bacilli were demonstrated for the first time in this colony in the beginning of 1913 when an epidemic occurred among the natives at Dar-es-Salam. Later, Indians and Europeans were atacked. The cases were benign and generally cleared up in a few days. The administration of Uzara was very useful. From April 1913 to 31st March 1914, 161 cases of dysentery were examined with the result that 45 proved to be cases of bacillary dysentery, 9 of amoebic dysentery while 107 gave negative findings. Of the 45 bacillary cases, 15 gave positive agglutination and positive stools, 21 gave positive agglutination and negative stools and 9 gave negative agglutination and positive stools.

The author proceeded to test 16 isolated strains by agglutination and fermentation reactions, at the same time comparing them with a series of stock strains of Shiga and Flexner obtained from various German institutes. Nine strains were agglutinated nearly to the titre limit by immune Flexner serum, two being probably identical with B. Flexner and seven with Bac. Y. A few strains isolated from dysenteric stools gave gas in glucose and, though the author hesitates to enrol them in the Dysentery group, he is inclined to think they may have been causally connected with the disease in view of the fact that the patients' sera agglutinated them. [These gas forming bacilli are not described in detail and we are not informed of the agglutination titre reached by the patients' sera. The fact that they were agglutinated by an *immune Flexner serum* obtained from Dresden is of little moment, as this particular serum is shown by the author to have been incapable of differentiating B. Shiga from B. Flexner.]

No strains were found to give the fermentation and agglutination reactions of B. Shiga. Some curious variations are noted; e.g. one strain, which was agglutinated by a Shiga serum, gave acid on mannite and maltose. Another strain which had not fermented mannite or maltose after seven days was only slightly affected by Shiga serum but agglutinated nearly to the titre limit by a Flexner serum. The employment of mannite as the sugar for differentiating between B. Shiga and the great group headed by B. Flexner, Bac. " Y " and Bac.

"Strong," etc., should, in the author's opinion, be given up and he quotes in support an observation of BUTJAGIN who noted the acquisition of Flexner sugar reactions by a Shiga strain which had been passaged for 1½ years on agar. [The use of mannite in this connexion will not lightly be given up and certainly not as the result of isolated observations of this character. The necessity of establishing on a sound basis far-reaching variations of this character, by accurate, long-continued research, does not require to be insisted upon.]

The use of maltose in the differentiation of Flexner from Y, the reaction on litmus milk and the indol reaction, are admittedly variable characters in the mannite fermenting group. [At the same time, the employment of the term "Y" type for strains which, on their first isolation, fail to ferment maltose and produce little or no indol is a very convenient working rule and not improbably the distinction may be found to be correlated with a clinical difference.] The author's conclusion that even the differentiation of toxin-production breaks down and that certain strains of Shiga have this property only slightly developed was only to be expected after his views on the mannite test. His proposal to group all Dysentery bacilli irrespective of fermentation reactions (Shiga and Flexner alike) into one common genus with sub types or races arranged according to their reaction with immune sera prepared by immunising with Kruse strains A, B, D and E and the original Shiga-Kruse strain, is not likely at present to receive much support.

J. C. G. L.

RIBEYRO (Ramón E.) & BAMBARÉN (Carlos A.). **La disenteria bacilar existe en Lima.** [Existence of Bacillary Dysentery in Lima.]—*Cron. Med. Lima.* 1915. Jan. Vol. 32. No. 619. pp. 3–5.

Hitherto only amoebic dysentery has been recognised in Lima, but the authors are now able to put on record a case of the bacillary variety of the disease. The patient was a man, aged 20, a native of the country, who entered the local hospital with symptoms of dysentery and was treated for ten days with emetin injections without success, on the supposition that the complaint was amoebic. Large doses of bismuth internally were equally ineffective. A more detailed examination of the case revealed no amoebae in the stools, but on the other hand the patient's serum agglutinated the Shiga bacillus in a dilution of 1 : 500. With samples of B. Kruse and B. Flexner agglutination ceased at 1 : 50. On the strength of these findings the patient was treated with hypodermic injections of DOPTER'S anti-dysenteric serum, procured from the Pasteur Institute at Paris, with satisfactory results.

J. B. N.

GETTINGS (H. S.). **Bacillary Dysentery.**—*Trans. Soc. Trop. Med. & Hyg.* 1915. Feb. Vol. 8. No. 4. pp. 111–125.

This paper deals with certain aspects of bacillary dysentery as met with in Northern climates, but more especially in the British Isles, where it may be taken as an index of the sanitary condition of the community. From its history bacillary dysentery is essentially an

epidemic disease, especially in lunatic asylums where apparently its incidence is as marked as ever. It is a mistake to call bacillary dysentery a tropical disease; it is prevalent there only because of the insanitary conditions. A detailed account is given of the various historic outbreaks of dysentery during Marlborough's and the Napoleonic campaigns. The disease prevails only to a small extent in armies under peace conditions; thus during the year 1909 only 137 cases were registered in the French army. In English lunatic asylums there have been numerous cases during the last few years; in 1909 for instance there were 1,159 cases with 270 deaths. In Wakefield asylum dysentery has existed since its inception in 1818 and it has lingered there till the present day. In 1911 there were nearly 300 cases in spite of sanitary measures of all kinds which have been introduced. In Scottish asylums dysentery is rare, probably because they are not crowded to the same extent.

As regards the bacteriology, Flexner's bacillus was isolated from 50 per cent. of the cases when the epidemic was at its height and considerable minor variations in the sugar reactions were given by various colonies of dysentery bacilli isolated from the same stool. Morgan's bacillus No. 1 was found in a few cases. The agglutination reaction of dysenteric sera was found to be very unreliable. It is probable that the epidemics originate and are kept up by bacilli carriers, but in an asylum it is especially difficult to detect these.

P. H. B.

von Jagić (N.). **Ueber das Verhalten der Körpertemperatur bei Dysenterierekonvaleszenten.** [Temperature Records in Dysentery Convalescents.]—*Wien. Klin. Woch.* 1915. Mar. 18. Vol. 28. No. 11. p. 299.

The author made accurate temperature records in a series of convalescent cases of bacillary dysentery. These convalescents had been returned to hospital owing to general weakness, although the stools were quite normal. The last diarrhoeal stools had been passed fourteen days to four weeks previously. In spite of the normal character of the stools and the absence of any complications, the body temperature (axillary) showed a slight elevation (37°–37·8° C.), which lasted from six days to three weeks. This rise of temperature appeared daily during the afternoon hours or occasionally every third or fourth day and had no relation to exercise or rest. It was also independent of the treatment employed during the dysentery period. The author suggests as a possible cause of the temperature, the ulcerative intestinal lesions which have been demonstrated by the rectoscope in such cases while the stools appeared normal. He notes also that the symptom may be helpful from the sanitary point of view as pointing to a past dysentery in the field.

J. C. G. L.

Klima (C.). **Hefe-Präparat Jaroschka-Richter bei Ruhrerkrankungen versuchweise angewendet.** [The Yeast Preparation Jaroschka-Richter in its Experimental Application to Dysenteric Infections.] *Prager Med. Woch.* 1914. Nov. 12. Vol. 39. No. 46. p. 560.

The author gives his experience with a new yeast preparation, as a

medicament in bacillary dysentery. It had been previously used in the treatment of diarrhoea in calves, as an astringment. It was said to be quite free from toxic substances. The dose employed in the cases of bacillary dysentery was 3-4 teaspoonfuls daily. Even after the first dose definite improvement set in and the stools became firmer. Only a few patients were unable to tolerate the powder. After improvement set in half a teaspoonful was given 2-3 times a day, shaken up with water, milk or tea.

A chemical analysis of the substance is supplied.

J. C. G. L.

REMLINGER (P.) & DUMAS (J.). **Sur une épidémie de dysenterie bacillaire, observée dans l'Argonne.**—*C. R. Soc. Biol.* 1915. May 28. Vol. 78. No. 9. pp. 254–257.

In December, 1914 the authors were commissioned to proceed to Sainte-Menehould in the Argonne to investigate an epidemic supposed to be dysentery. They remained at this spot from 25th December to 15th February 1915 and at Condé-en-Barrois from 16th February, to 22nd March, during which time they examined several hundred patients. Points of clinical interest were the small number of motions, the absence of complications, the natural tendency to cure and the inefficacy either of anti-Shiga serum or of polyvalent anti-Shiga-Flexner-Y serum. They studied 25 strains isolated from the excreta; 23 of these agreed in all respects with Bac. Y of HISS and RUSSELL. They did not ferment maltose, produced little or no indol and were agglutinated by a "Y" serum in dilutions varying from 1 in 500 to 1 in 4,000. The sera of the patients attacked gave feeble agglutination at the commencement of the disease but the titre rose to 1 in 50–1 in 100 towards the 12th or 15th day and reached its maximum at convalescence. They also note that the Argonne "Y" bacillus was agglutinated by normal healthy individuals only in 1 in 10 dilution, 1 in 25 being exceptional. [Technique and observation period not stated.]

From the 10th to 15th day it was also possible to demonstrate complement-binding bodies in the patients' sera. During this same epidemic, two grave cases were found to be infected by B. Shiga.

J. C. G. L.

DOPTER (Ch.). **La Dysenterie bacillaire dans les Armées en Campagne.** —*Paris Méd.* 1915. Apr. 24. No. 51. pp. 510–512.

Brief historical survey of bacillary dysentery as a disease which constantly follows armies in the field. All the great struggles of the 17th, 18th and 19th centuries were marked by its epidemic development in degrees surpassing that of other infections. For example, in the war of 1870 there were in the German army 38,652 cases with 2,000 deaths. In the Russo-Turkish war there were 41,300 cases and in the Boer war (according to BIRT) one-sixth of the deaths were due to bacillary dysentery. In the last Balkan war, though no exact figures are available, bacillary dysentery was frequent in Turkey, Bulgaria

and Serbia. As a rule, in times of peace dysentery has a marked seasonal prevalence, commencing at the end of June or beginning of July, attaining a maximum in August, and declining towards the end of September. In war, however, it does not tend to disappear in the winter. Owing to constant change of occupiers, cantonments and camps already contaminated become vast pandemic foci where dysentery rages without interruption. Factors predisposing soldiers to specific infection by *B. dysenteriae* are lack of warm clothing, bivouacking on moist soil, prolonged sojourn in wet trenches, unsuitable food, the drinking of impure brackish water and acute or chronic exhaustion, etc. In any rational prophylaxis against the disease, these predisposing factors must be combated.

J. C. G. L.

von Jaksch (R.). **Ueber Ruhr (Dysenterie).**—*Prager Med. Woch.* 1914. Vol. 39. No. 41. pp. 513–515.

General paper dealing with the aetiology, pathology, diagnosis, prophylaxis and treatment of bacillary dysentery. A large proportion of the cases observed by him were Shiga infections but they were not of severe type and only one patient died. [The total number of cases is not given.] With regard to therapy the author commences with castor oil and does not approve of calomel. Bolus alba is recommended in doses of 10–100 gm. in 200–300 cc. of water daily. Opium is prescribed for sleeplessness and, if tenesmus is severe, subcutaneous injections of morphine and enemas of tannin are given. Animal charcoal was also useful. Intravenous inoculation of saline fluid (15 gm. Na Cl, 0·45 gm. Ca Cl_2, 0·7 gm. K Cl in 1,000 cc. water) proved of the highest value in the very severe cases.

Specific therapy with antidysentery serum he had no experience of, as the cases were not severe enough to call for its employment.

J. C. G. L.

Singer (Gustav). **Ueber dysenterische Rheumatoide.** [On Dysenteric Rheumatoid Conditions.]—*Wien. Med. Woch.* 1915. Feb. 6. Vol. 65. No. 6. pp. 318–322. With 3 text figs.

The author gives a brief review of the literature of joint affection as a complication of bacillary dysentery. His belief is that the ulcerative processes in the bowel offer opportunities for invasion of the organism by secondary bacteria, particularly pus forming bacteria, which latter reach the joints and cause the rheumatoid changes.

In the course of an experience with 600 dysentery cases (Vienna) the author noted seven complicated by polyarthritis. One very severe case is recorded in detail. The patient was admitted on September 25th, 1914 suffering from dysentery with passage of blood and mucus and painful swellings in the region of the knee joints. Puncture fluid from joint was slightly cloudy but sterile (twice examined). On October 1st the metacarpophalangeal joint of the right middle finger was swollen and the skin over it reddened. On October 18th a bullous erythema appeared over the knee and wrist joints. On October 21st a similar efflorescence appeared on the front of the thorax. Strepto cocci were isolated from blood taken from the arm vein and from the

skin pustules. Staphylococci and streptococci were recovered. The patient's serum agglutinated B. Shiga completely in 1 in 50 and incompletely in 1 in 100. From October 24th electrargol was given intravenously in 5 cc. doses increasing to 15 cc. daily. On October 31st a fresh eruption appeared over the parotid region. Polyvalent antistreptococcal serum was given on 7th, 8th and 10th November in doses of 50 cc., 50 cc., and 100 cc. subcutaneously. After December 28th the temperature remained normal. Some thickening of the joints remained, but absolutely normal function returned.

J. C. G. L.

WEINBERGER (M.). **Verhütung und Behandlung der infektiösen (Bazillen-) Dysenterie.** [Prevention and Treatment of Bacillary Dysentery.]—*Wien. Med. Woch.* 1914. Nov. 21. Vol. 64. No. 47. pp. 2396–2401; Nov. 28. No. 48. p. 2428.

General paper dealing with bacillary dysentery in all its aspects and not suitable for condensed review. In discussing treatment the author expresses strong faith in the value of calomel though it is contraindicated when albuminuria is present. In such cases castor oil is to be preferred. Practically the whole gamut of pharmacopoeal drugs useful in the treatment of diarrhoea generally, heart weakness, tenesmus, sleeplessness, etc. are referred to without any particular guiding lines and the reader is left to take his choice. Bolus alba (as recommended by STUMPF in cholera) and animal charcoal receive favourable mention. They may be given together with advantage. The use of hypertonic saline solutions (following ROGERS in cholera) is also recommended. In chronic dysentery, indolent ulcers in the lower bowel may be demonstrated by the rectoscope and touched with 2 per cent. silver nitrate (as recommended by LENTZ and KANTOROWICZ). Dysentery serum may also be given in enema along with eucalyptol.

J. C. G. L.

SINGER (Gustav). **Erfahrungen aus der letzten Dysenterieepidemie.** [Experiences from the last Dysentery Epidemic.]—*München. Med. Woch.* 1915. Feb. 9. Vol. 62. No. 6. pp. 183–184.

The present communication supplements a previous paper (*Medizinische Klinik*, 1914, No. 44) and concerns itself with an outbreak of dysentery in the Schwarzenberg barracks. In the previous paper the author insisted upon the value of rectoscopic examination; this he reiterates in the present one. More particularly is this method of value during convalescence after the acute attack. Often at this stage bacteriological examination of the stools is quite untrustworthy; nevertheless the author commonly found, especially in upper tracts of the large gut, bleeding ulcerations of varying intensity at such a time as the patient was eating normal food. This apparent contradiction between the local lesion and the patient's well-being is of such frequent occurrence that the author is inclined to rely more upon the rectoscopic inspection than on the general appearances in discharging a patient from hospital. Several observations on the

blood in dysentery are recorded. Generally there is an increase of the erythrocytes up to 6,000,000, of the haemoglobin to 120 per cent. and a leucocytosis of 30,000 ; of the white corpuscles the lymphocytes and large mononuclears are relatively increased. Convalescence was often complicated by a peculiarly obstinate constipation, generally accompanied by bradycardia and a moderate pyrexia. A relapse occurred but once.

Of complications the following are included :—Myalgias especially of the deltoid and trapezii, intercostal neuralgias, conjunctivitis, urethritis and arthritis of the knee joint, which latter occurred in seven cases. Of the therapeutic measures employed the following are especially noted : rectal injections of saline and adrenalin solution in haemorrhagic cases. The value of antidysenteric serum was attested by the general improvement of the patient's well-being and the arrest of haemorrhage, but the diarrhoea is not vitally affected thereby. In one particular case an injection of normal horse serum was given with apparently beneficial results. In a series of toxic cases, in which for some reason or other the injection of antiserum was impracticable, intravenous injection of hypertonic saline was given with most favourable results and rapid disappearance of toxic symptoms. This beneficial effect the author is inclined to ascribe to neutralisation of the dysenteric toxin by chemical action rather than to the production of osmosis.

P. H. B.

SOLDIN (Max). **Zur Behandlung der Kriegsruhr.** [Treatment of Dysentery in War.]—*Therap. Monatshefte.* 1915. Mar. Vol. 29. No. 3. pp. 145–147.

Bacillary dysentery among the soldiers has, in the writer's experience, been of a relatively benign character. In August and September last, many soldiers passed through an attack without having to leave their posts. Of the cases observed 96 per cent. were slight attacks and 1·2–1·5 per cent. were fatal while 2·5 per cent. took on a chronic character. In the severe or pernicious varieties death took place in 7–17 days and no therapy was of any avail. Generally the diarrhoea ceased about 24 hours before death. As the patients could drink well, saline infusions were not necessary. They were however prescribed but only transient improvement resulted.

The following was the treatment prescribed in slight cases :—For the first two days gruel only, with unsweetened tea or cocoa for the thirst. On the third day, a few biscuits with one or two tablespoonfuls of white cheese were prescribed. Eggs or veal in readily digestible form might be given on the sixth day and by the tenth day ordinary food could be given with safety. Soft cheese was found to be very useful. It was freshly prepared from sour milk heated to 40° C. Dietetic treatment alone sufficed to cure but occasionally bolus alba, bismuth and tannin, etc. were given without materially hastening recovery.

In chronic cases going on for perhaps three months bismuth was given in large doses. Fresh relapses were often accompanied by heart weakness for which caffein, camphor and digitalis were prescribed.

Opium and morphine were given to combat sleeplessness but only at the request of the patient. In these chronic cases meat, eggs and vegetables might be given with impunity at a time when 20 stools a day were being passed. Each patient had a warm abdominal binder.

J. C. G. L.

RUMPEL (Th.). **Die Dysenterieerkrankungen der Kriegsverwundeten im Allgemeinen Krankenhaus Barmbeck.** [Dysentery-like Illnesses of the Wounded in the General Hospital at Barmbeck.]—*München. Med. Woch.* 1915. Feb. 9. Vol. 62. No. 6. pp. 180–182.

Cases of dysentery reported from and originating in the town of Hamburg are extremely rare, amounting from the returns of the last ten years to only 1·8 per annum. The author has never succeeded in isolating any of the dysentery organisms from diarrhoeic or other evacuations in the various hospitals of the town.

The present paper deals with dysenteric attacks which prevailed amongst 623 wounded returning from the battlefields of France between the 8th August and the 1st October, 1914. Most of the cases had borne the hardships and fatigues consequent on the famous dash on Paris. The heat, shortage of food and the drinking of polluted water gave rise in the last few days of the march to attacks of diarrhoea, which did not however unfit them for their military duties. Only eight however passed blood in their motions and only five of these were invalided on account of their intestinal symptoms; the remainder were all more or less seriously wounded.

On admission to the hospital forty had pronounced dysenteric symptoms, colic, tenesmus and meteorism; in a few arthritic and cardiac symptoms supervened.

The infection appears to have been of a very mild type as all symptoms disappeared after eight days.

Bacteriological investigation of the stools was undertaken with the most stringent aseptic precautions by Dr. GRAETZ according to the generally accepted methods, and bouillon dilutions were plated out on Endo agar. Of forty patients with dysenteric symptoms the serum of thirty-five gave a positive reaction with the Flexner bacillus and from the stools of twenty-nine of these this bacillus was isolated; nevertheless, the serum of these same patients gave a positive reaction with the typhoid and three times with the paratyphoid bacillus. These organisms were also present in the stools of these particular cases. At the same time seventeen wounded men of the same army were examined who had while on service suffered from diarrhoeic attacks; of these nine gave a positive agglutination reaction in a strength of 1 in 320 to 1 in 640, while in two dysentery bacilli were found in the stools.

Similar results were obtained with wounded men from Flanders, in one of whose stools typhoid bacilli were demonstrable but who at the time had had no symptoms whatever of the disease.

From the Eastern front latterly thirty-six soldiers were examined, of whom two had well marked attacks. Three of these gave a positive blood reaction towards the Flexner bacillus and one paratyphoid carrier was found.

The proportion of dysentery carriers to those actually suffering from symptoms of the disease appears to be an abnormally large one; this is not to be wondered at seeing that the illness was of a particularly mild type and thus conducive to the "carrier state."

The question how these carriers should be disposed of is a difficult one, for it was ascertained in this instance that the bacilli were retained in the intestinal canal for sixty days. It would therefore be a very serious matter from a military point of view to detain the very large number of bacilli carriers on such a widespread field of operations as obtains in the present war.

The same question appertains, but to a much more serious extent, to typhoid and paratyphoid carriers; from a military point of view these should be detained in hospital until the intestinal canal is free. In the series under discussion these were present to the extent of 4·62 per cent.

The biblical proverb is here applicable—Seek and ye will find—and therefrom it holds good that the number of bacilli carriers is proportionate to the number of investigating bacteriologists.

P. H. B.

MARCOVICI (Eugen). **Ein Fall von Elephantiasis nach Lymphangoitis postdysenterica.** [A Case of Elephantiasis following on Lymphangitis postdysenterica.]—*Wien. Klin. Woch.* 1915. Jan. 21. Vol. 28. No. 3. p. 64. With 1 text fig.

Many complications of dysentery, such as arthritis, neuritis, etc. have been observed in the recent Austrian epidemic. Amongst the rarest of these is a disturbance of the lymphatic system such as occurred in the present case—a reservist of 36 years of age—which is illustrated by a photograph showing a well marked oedema with limitation of movement of the left leg. X ray examination of the joints was negative; the limb was extremely painful and the skin hyperalgesic. The serum strongly agglutinated dysentery bacilli two and a half months after the attack and when the swelling of the leg first became visible. The blood showed a relative anaemia with a moderate leucocytosis. The elephantoid swelling of the limb has become more and more marked after separate attacks of lymphangitis.

P. H. B.

FLEXNER (Simon) & AMOSS (Harold L.). **The Rapid Production of Antidysenteric Serum.**—*Jl. Experim. Med.* 1915. May 1. Vol. 21. No. 5. pp. 514–524. With 3 text figs.

The increased demand for anti-dysentery serum owing to the war led the authors to undertake an improvement in its preparation, especially with a view to reducing the time required for the immunisation of horses. Hitherto horses have been injected with cultures of soluble products of dysentery bacilli over long periods of time, the inoculations being chiefly subcutaneous. Owing to the occurrence of ulcerations, etc. leading to postponement of immunisation it frequently took 9–12 months to secure an efficient serum. The authors have applied the principle of repeated inoculation at short intervals—a method which has proved successful in obtaining potent agglutinating,

precipitating and cytolytic sera in small animals. Immunisation was begun with a three-day course of *intravenous* injections of killed bacilli belonging to the "Flexner" group. (Agar cultures grown 24 hours at 37° C. Each slope suspended in 2 cc. of 0·8 per cent. saline. First dose = 1 cc. of suspension, heated at 60° C. for 30 mins. Second dose = 5 cc. Third dose = 5 cc.). These three doses were given on three successive days. After an interval of seven days a second 3-day course of live bacilli of "Flexner" group, was given, viz. 4 loops on 1st day, 10 loops on 2nd day and 20 loops on 3rd day. After another 7-day interval a 3-day course of living "Shiga" bacilli were given alternately, the doses being chosen so as to produce a sharp febrile reaction, subsiding in 24 hours. After 10 periods of 3-day inoculations the serum was tested for agglutination titre and protective value in guinea-pigs and rabbits. Various strains of "Flexner," "Strong," "Y," and Shiga bacilli had been employed for immunisation. The antiserum obtained agglutinated Flexner strains up to 1 in 4,000, "Strong" strains up to 1 in 4,000, "Y" strains up to 1–5,000 and Shiga strains in 1 in 1,200 to 1 in 4,000. The rise in agglutinins was more pronounced for the Flexner group than for Shiga strains.

To test its protective action guinea-pigs were inoculated intraperitoneally with mixtures of living Flexner or Shiga bacilli and dilutions of the antiserum, while rabbits were inoculated intravenously with mixtures of Shiga toxin and dilutions of the antiserum. The Shiga toxin was prepared from a 3-day growth of Shiga in sugar-free broth containing calcium carbonate, the organisms being finally killed with ether and removed by filtration through hardened filter paper. The result of the tests was as follows:—Before immunisation 0·5 cc. of the normal horse serum was able to prevent death when mixed with 2 M.L. doses of Flexner bacilli or 2 M.L. doses of Shiga bacilli, but this quantity of serum did not prevent death when mixed with 4 M.L. doses of Shiga toxin.

After immunisation, 0·008 cc. of the antiserum protected against 2 M.L. doses either of Flexner or Shiga (intraperitoneal inoculation of guinea-pigs of 225 gm. weight) while 0·003 cc. protected against 4 M.L. doses of Shiga toxin (intravenous inoculation of rabbits of 1,250–1,500 gm. weight).

An efficient serum for therapeutic employment in man was thus ready after an 8–10 weeks' course of immunisation. Regular bleeding was begun at the 10th week and thereafter continued with intervening immunisation periods.

J. C. G. L.

SONNE (E.). **Beobachtungen über Klinik und Epidemiologie der giftarmen Dysenterie-bazillen-Infektion in Dänemark.** [Observations on the Clinical and Epidemiological Aspects of Bacillary Dysentery in Denmark due to the Non-Toxin producing types.] —*Zeitschr. f. Klin. Med.* 1914. Vol. 81. No. 1–2. pp. 73–112.

This is a valuable paper dealing with the clinical and epidemiological aspects of sporadic bacillary dysentery in Denmark caused by various members of the mannite fermenting group of *B. dysenteriae*. The paper also contains data concerning the presence of dysentery bacilli in the excreta of children suffering from gastro-enteritis. These latter

data are of particular interest to us in England where considerable bacteriological research has been devoted to this subject. In this review the more important data only are referred to as the paper does not lend itself to condensed reference. The purely bacteriological aspects of the work are separately published in the *Centralbl. f. Bakt.* 1. Abt. Orig. 1915. Vol. 75, p. 408.

During nineteen months, September 1911 to March 1913, 1,482 samples of faeces from various sources (typhoid, paratyphoid, dysentery, etc.) and 99 samples of urine were examined specially for *B. dysenteriae* in the Diagnosis Department of the Serum Institute at Copenhagen; 62 samples gave positive and 1,420, negative findings. Cases giving positive findings occurred at all seasons of the year, even during the winter months. They were essentially sporadic. Of the 62 positive samples, 30 came from children under six years of age in Copenhagen. These will be considered later. Of the 32 positive samples from persons over six years of age and adults, 12 contained blood with or without mucus, 12 had mucus but no blood, while 8 contained neither. With regard to the nature of the infection in these cases among adults: the great majority, so far as their history could be enquired into, suffered from attacks of moderate severity; a few had severe attacks, while one adult had apparently no complaint at all. In several cases the disease ran a chronic course or tended to relapse. Accurate clinical details could not be obtained but, as a rule, the disease commenced suddenly with a feeling of malaise, slight fever, and more or less severe diarrhoea. The fever (only in one case reaching 40° C.) disappeared after a day or two and the patients as a rule got well rapidly, the blood disappearing from the stools in a few days. Occasionally the motions were thin and slimy for some time and convalescence was retarded.

Of the 1,420 negative samples, 48 came from persons who on a previous or later occasion gave positive results, 18 contained blood and sometimes mucus, 37 contained mucus without blood, while 141 came from children suffering from gastro-enteritis. The remainder of the negative samples (viz. 1,176) came from individuals who in all probability had no symptoms pointing to dysentery or diarrhoea. They were mainly suspected typhoid or dysentery carriers or persons in the entourage of such. The 99 urine samples were all negative.

With regard to the results obtained in gastro-enteritis among children examined mostly during the summer and autumn season of 1912, 27 cases out of 144 gave positive findings. Of the 27 cases 19 were under one year and eight between one and six years of age; 123 children, suffering from conditions not accompanied by diarrhoea, e.g. rickets, bronchitis, eczema, etc. gave entirely negative findings. With regard to the clinical symptoms in the positive cases, the onset was sometimes sudden with frequent slimy or thin watery motions. In 75 per cent. blood was present at some time in the motion. The disease tended to run a chronic course. Only occasionally were the patients well in 8–14 days and as a rule 1–2 months elapsed before the stool became normal and free from mucus. Ten per cent. of the cases were fatal. Of the 117 cases of gastro-enteritis which gave negative findings qua *B. dysenteriae*, clinical histories were available in 62 and of these 18 per cent. were fatal while 22 showed evidence of more or less severe intoxication, and these included most of the fatal cases.

Haematemesis occurred in six cases, whereas among the cases giving positive findings this symptom was never noted.

The author was unable to decide that on purely clinical grounds a distinction could be drawn between cases in which dysentery bacilli were demonstrated and those in which negative findings were obtained. He believed however that the presence or absence of blood in the stools offered valuable differential evidence. It was remarkable that of the 62 cases negative qua *B. dysenteriae*, only nine had blood in the stools (13 per cent.) while of the 27 cases positive qua *B. dysenteriae*, 75 per cent. presented blood stained stools. He comes to the conclusion that a bloody stool in gastro-enteritis affecting small children is present only when dysentery bacilli are present. It has to be observed that the author examined only a small proportion of the total number of such cases in the summer of 1912. 2,200 were reported in 1912 in Copenhagen. [The finding of *B. dysenteriae* in a certain proportion of cases of summer diarrhoea or rather of gastro-enteritis occurring during the summer and the presence of blood in the motions of 75 per cent. of these, are important points. The absence of *B. dysenteriae* in another group of cases which did not show bloody stools but which ran a more severe course accompanied by evidence of intoxication is equally important and strongly supports the view that there are two predominant types of summer diarrhoea—a toxic or choleraic form and a true dysenteric form. In London the former prevails in a bad season and *B. dysenteriae* has not with certainty been recovered therefrom. Morgan's Bacillus No. 1 has been most closely associated with the choleraic form (see paper by Morgan and Ledingham, Proc. Roy. Soc. Med.; Epid. Sect. 1909). It is quite possible however that some of our London cases may be genuine cases of bacillary dysentery, especially as *B. dysenteriae* (Flexner Y type) has been found to be the causative agent in at least one small dysentery outbreak amongst children. In America the two types occur, one with and the other without the presence of *B. dysenteriae* in the excreta.]

J. C. G. L.

Gettings (H. S.) & Waldron (Ethel). **The Detection of a Dysentery Carrier.**—*Jl. Mental Sci.* 1914. Oct. Vol. 60. No. 251. pp. 605–608.

In a previous paper one of the authors (Gettings) had attributed the persistence of bacillary dysentery in the West Riding Asylum to carriers and chronic cases [see this *Bulletin*, Vol. 3, p. 84.] The present paper contains notes of an instructive carrier case. A female patient admitted in 1910 had passed loose stools (2–5 a day) for four years without any further symptoms. These stools never contained blood. A mannite-fermenting *B. dysenteriae* was isolated by the authors from the excreta and it appeared highly probable that the patient had entered the asylum in an already infected state and had been responsible for a succession of dysentery cases in the asylum since her admission. The authors insist on the importance of regarding seriously cases of this kind which would very probably be labelled simply as chronic diarrhoea. It is, in their opinion, imperative to watch these quiet chronic cases which do not present the ordinary appearance of dysentery and consequently go so often unrecognised. The question arose

whether one ought to isolate every patient showing persistent looseness of stools irrespective of a negative bacteriological finding. The discharge of *B. dysenteriae* is possibly intermittent in these cases and consequently it may not be possible, without repeated examination, to demonstrate the specific cause. Many of these may, however, be quite innocent.

J. C G L.

Mixed and Unclassed Dysentery.

Hallenberger. **Die Aetiologie der Dysenterie in Südkamerun.** [The Etiology of Dysentery in South Cameroon.]—*Arch. f. Schiffs. u. Trop. Hyg.* 1914. Aug. Vol. 18. No. 16. pp. 551–564. With 1 plate.

Before the writer came to this colony in 1911 yearly reports had indicated the presence of both amoebic and bacillary types of dysentery, but the proportion in which each occurred was not clear. The general impression in 1911 was that the amoebic form occurred the more frequently, but the writer determined to investigate the question carefully and examine all cases microscopically and bacteriologically. In all, 62 cases were examined. They occurred sporadically and the patients came both from the bush and from the coast. The sample of population therefore from which the samples came was fairly representative. Of these 62 cases, 55 proved to be bacillary, and 4 amoebic, and of the bacillary cases, 29 contracted the disease in the coast region. Endemic dysentery in Cameroon is therefore mainly bacillary. With regard to the amoebae found in these few cases, they agreed in practically every particular with Hartmann's *Amoeba tetragena*. Cysts were never observed and no case of liver abscess was met with. Fifty-eight dysentery strains were carefully examined by agglutination and fermentation methods, 23 proving to be B. Shiga and 35 of Flexner type (maltose fermentation in all, positive).

Certain variations occurred in some strains after passage for 18 months on artificial media. Thus six Shiga strains failed to give acid reaction on glucose, while two had acquired the property of fermenting maltose. Of the Flexner strains four had given acid on cane sugar when originally isolated [? B. Strong] while seven at the end of one year had apparently acquired the power of fermenting cane sugar. The strains isolated were also tested with the homologous sera from the patients and in nearly all cases a positive reaction was obtained, the titres varying from 1 in 100 to 1 in 2,000. The variant strains when tested with specific sera gave the same agglutinaton reactions as the original strains from which they were derived. The writer makes the important statement that in tropical climates it does not always hold that B. Shiga causes the severe forms of infection while the mannite fermenting type are responsible for the slight cases. He had observed quite slight cases due to B. Shiga and some very severe cases due to B. Flexner. Both types can produce a true dysentery.

J. C. G. L.

TESTI (Francesco). **Sulla Dissenteria in Cyrenaica.** [On Dysentery in Libya.]—*Giorn. Med. Milit.* 1915. Jan. 31. Vol. 63. No. 1. pp. 43–48.

The author gives some interesting figures as to the prevalence of dysentery among the Italian troops during the war of 1913-1914 in Libya, as follows :—

Number of cases per mille of dysentery from July 1913 to August 1914.

1913.			1914.		
July ..	.. per mille	0·1	January ..	per mille	0.01
August ..	.. ,,	6·0	February ..	,,	0·0
September	.. ,,	1·0	March	,,	0·0
October ..	.. ,,	0·5	April	,,	0·1
November	.. ,,	0·09	May	,,	0·4
December	.. ,,	0·5	June	,,	0·1
			July	,,	0·9
			August ..	,,	0·02
			September ..	,,	0·0

J. B. N.

NOC (F.). **Parasitisme intestinal en Cochinchine. Contribution à l'étude des dysenteries indo-chinoises.**—*Bull. Soc. Path. Exot.* 1915. Apr. Vol. 8. No. 4. pp. 208–217.

The earlier portion of this paper is devoted to a criticism of certain views put forward by BRAU [see this *Bulletin*, Vol. 2, p. 189], who attempted to re-establish intestinal anguillulosis (strongyloidosis) as a causative factor in the chronic diarrhoeas of Cochin-China. According to Brau's observations, these parasitic infections were accompanied by a high degree of eosinophilia which was of diagnostic significance even in the absence of larvae from the stools. Noc proceeds to discuss the general question whether these intestinal helminths are pathogenic or not in the dysenteries and diarrhoeas of Cochin-China and at the close of a review of the chief writings on this subject comes to the conclusion that ,in spite of the interest attaching to the observations of TEISSIER, ASKANAZY, DARLING and YOKOKAWA, according to whom the Anguillula and its larva are capable of causing a leucocytic infiltration of the intestinal tissues, the characters of this reaction and the troubles which may ensue therefrom do not so far justify us in defining precisely the intestinal symptoms for which this intestinal parasite is responsible. In Cochin-China, where malaria, amoebic or bacillary dysentery, strongyloidosis, etc. prevail (sometimes in the same individual) experimental study of this question is difficult.

In default, the writer believes that it would be of interest to compare notes on some cases of intestinal trouble in the course of which anguillulae appeared. In 1914, only four such cases had been observed in the course of an examination of nearly 400 cases of dysentery or diarrhoea, either by his predecessor BRAU or by himself. In these four cases there was always some other factor, either amoebae or *B. dysenteriae*. Notes of the cases are detailed, three being amoebic and one chronic bacillary (Type Flexner) with amoebae as well. In spite of the presence of helminths each of these cases pursued the course characteristic of amoebic or bacillary

dysentery. The case in which B. Flexner was present in addition to amoebae, came to autopsy and a histological study was made of the large intestine, the mucosa of which was congested and beset with numerous ulcers containing pus, some being superficial and others deep. Amoebae were not found in the pus from these ulcers. Histologically, amoebae were scarce in the superficial zone of the mucosa and there were no amoebae or anguillulae in the various layers of the intestinal wall. Numerous larvae of anguillula were found in material from the duodenum, becoming less numerous lower down but they could be detected even in the appendix. In the presumed neighbourhood of the adult anguillulae (their exact site in the duodenum was not ascertained) no pathological change in the glands was detected and the blood vessels showed only a slight degree of sclerosis. There was no local intestinal eosinophilia. The lesions found post-mortem were essentially those of chronic bacillary dysentery. The amoebae and possibly also the anguillulae appeared to have played only an irritative rôle and certainly a secondary one in face of lesions observed frequently in dysenteries due to B. Flexner.

In the discussion of this paper, LAVERAN expressed the view that anguillulae, especially if numerous, cannot be considered entirely innocuous, and that patients who harbour these helminths do well to get rid of them. In persons heavily infected with them, they undoubtedly irritate the mucosa of the intestine and perhaps also, harm is done by absorption of the toxins elaborated by them.

J. C. G. L.

PEISER (H.). **Störungen der inneren Sekretion bei Ruhr.** [Disturbances of the Internal Secretions in Dysentery.]—*Deut. Med. Woch.* 1915. Jan. 14. Vol. 41. No. 3. pp. 65–66.

Proptosis and exophthalmos were observed in dysenteric cases; and subsequently signs of such disturbance, other than thyroidismus, became observable in 10 per cent. of all dysenterics and in one case an enlargement of the thymus ascertainable by percussion.

In some cases the thyroid gland was distinctly palpable. In others a fine tremor of the eyelids, hands or tongue was ascertainable. In nearly all cases vasomotor changes were present and dermography could be demonstrated. Disturbances of the pancreatic secretion and function could be substantiated by the help of Loewisch's reaction.

The slight pyrexias and alterations in pulse rate so often observed during convalescence can be ascribed to these changes.

Renal secretion was disturbed and curtailed in some instances to less than one half. The most important disturbances are those of carbohydrate metabolism. The carbohydrate tolerance, especially after the subcutaneous administration of small doses of adrenalin, was markedly diminished. It is questionable whether this result is not due to irritation of the vago-sympathetic and through it to a dominance of the thyroid suprarenal group over the pancreatic-parathyroid group of glands. The author considers the therapeutic measures to be adopted; of these belladonna preparations especially have an effect on the vagus. The effect of this drug was especially noted in allaying the symptoms of spasmodic contraction of the small intestine.

P. H. B.

SALOMON (H.). **Pathologie und Therapie der Ruhr.** [Pathology and Therapy of Dysentery.]—*Wien. Klin. Woch.* 1915. Jan. 7. Vol. 28. No. 1. pp. 5–7.

This communication consists of a text-book lecture on dysentery. Some attention is paid to prophylactic inoculation of bacillary dysentery from which the Japanese have had some good results. Considerable attention is paid to the treatment and the therapeutic role of such drugs as simaruba and uzara is considered.

The lecture, which contains no original matter, is written as a ready aid to the profession during the war.

P. H. B.

QUINCKE (H.). **Ueber die Wandlungen des Ruhrbegriffs.**—*Med. Klin.* 1914. Nov. Vol. 10. No. 46. Pt. 2. pp. 1679–1681.

A brief paper containing a summary of the various etiological factors of dysentery considered as a clinical entity, the author being of opinion that, in addition to the well known causes such as amoebic infection and infection with *B. dysenteriae* (Shiga, Flexner, Y and Strong) many other causes may give rise to similar symptoms. Dysentery is, in the author's view, a clinical term only, and the clinical picture may be induced by microbes other than *B. dysenteriae* and by various chemical or mechanical injuries of the intestine. Such injuries may be induced by coprostasis, cold, the eating of half ripe fruit or raw vegetables and veritable epidemics may arise among troops from these causes. He admits however that corresponding to the different etiologies there may be certain differences in the clinical picture and in the course of the malady. It is not advisable to use the term dysentery (*Ruhr*) only for cases caused by dysentery bacilli because in many cases the demonstration of the bacilli in the stools cannot always be made. At the same time, every dysentery patient or suspected dysentery patient should be treated as if he was infectious, while bearing in mind that not every patient suffering from clinical "dysentery" is necessarily infectious. The author informs us that infections by Shiga, Flexner and Y bacilli occur among the troops and that "Y" infections are the most frequent. Bacteriological examinations of the stools should be carried out whenever possible, in order to establish the fact of specific infection with *B. dysenteriae.*

J. C. G. L.

LESCHKE (E.). **Ueber ruhrähnliche Darmerkrankungen.** [On Intestinal Affections simulating Dysentery.]—*Deut. Med. Woch.* 1914. Dec. 3. Vol. 40. No. 49. pp. 2028–2029.

The author informs us that dysentery is one of the most frequent diseases in this war especially among the troops (German) fighting on the eastern frontier. It is apparently the practice of field physicians to give a diagnosis of bacillary dysentery in all cases of intestinal trouble accompanied by the passage of blood and mucus. Bacteriological results would, in the author's opinion, support this diagnosis in the majority of cases but it is important to remember that cases

clinically indistinguishable from bacillary dysentery and accompanied by the passage of bloody mucous stools, may have an entirely different etiological basis. In support of his contention, he gives notes of eight cases among invalided soldiers. These had been sent home for treatment to Berlin owing to their having contracted "dysentery" at the front. In spite of the fact that frequent stools accompanied by blood and mucus appeared in the recent clinical histories of these cases bacteriological examination of the excreta in Berlin did not reveal dysentery organisms and agglutination results were negative with the patients' sera. On arrival in Berlin, blood had generally disappeared from the stools, though mucus might persist. Such cases cleared up very quickly, in fact, in a few days so that it was possible to return for service.

The author believes that diarrhoeal conditions accompanied by passage of blood and mucus may be due to a variety of causes, e.g. the consumption of unsuitable food, injury of the intestinal wall by the passage of coarse indigestible food, infections proceeding from the tonsils or upper respiratory tract following colds, etc. It was remarkable in this latter connection that all his patients presented the lymphatic constitution in a more or less marked form. The treatment included rest in bed, fluid diet, poultices to the abdomen and the oral administration of blood charcoal (15–25 gm. daily at hourly intervals) which proved more satisfactory than bolus alba in its presumed rôle of toxin-absorber. [That cases of the kind here described, with passage of blood and mucus, can occur apart from infection by dysentery bacilli is an important fact to remember but every attempt should be made to establish the absence of *B. dysenteriae.* A single negative finding in the excreta is not sufficient.]

J. C. G. L.

McCombie (F. C.). **Dysentery. Its Case Mortality in Relation to Treatment with Special Reference to Emetine, with the Object of elucidating on purely Clinical Grounds, the Incidence of Amoebic Dysentery on tea Gardens.**—*Indian Med. Gaz.* 1915. Jan. Vol. 50. No. 1. pp. 11–15.

This paper contains figures dealing with the case-mortality from "Dysentery" as it is met with in certain Assam tea gardens and from the results obtained by treatment with emetine, an attempt is made to ascertain the prevalence of the amoebic form. The data concerning the hospital cases may be adduced. Of 226 hospital cases, 24 were secondary cases with a death-rate of 87·5 per cent. The case-mortality in the primary acute cases was 26·5 per cent. and in the primary chronic cases 80 per cent. "Pure" treatments were unfortunately not employed, but of the total, 87 had emetine at some time during the treatment, with a death-rate of 66·6 per cent. In 43 the treatment was begun with ipecac or emetine with the result that 15 or 34·8 per cent. of these were cured, the inference being that only about 30 per cent. of the "Dysentery" cases were of amoebic origin. The author concludes that the treatment of dysentery in tea-gardens is unsatisfactory and enters a plea for the bacteriological investigation of cases with a view to more accurate diagnosis.

J. C. G. L.

AXTER-HABERFELD (Relli). **Ueber einen Fall von Emetinbehandlung bei Balantidiose.** [A Case of Emetin Treatment in Balantidiasis.] —*München. Med. Woch.* 1915. Feb. 2. Vol. 62. No. 5. p. 152.

The author, writing from Bello Horizonte, Brazil, describes his treatment of a case of Balantidian dysentery. The patient was a woman, aged 60, who had been ill four months with severe diarrhoea. Many treatments, including Uzara, had been tried without effect. The patient passed about twelve fluid stools daily, sometimes containing albumin and large quantities of blood. Numerous *Balantidium coli* were found in the faeces. Emetin was tried, 0·03 gm. being injected subcutaneously on eight successive days. The stools decreased to one per day after the first dose of emetin. After the third injection, all forms of the Balantidium disappeared. A slight eczema-like rash appeared at the sites of injection, but soon disappeared under treatment with ointment.

Balantidian dysentery is rare in the neighbourhood, and emetin having proved efficacious in this case, it is hoped that it may be of service elsewhere.

H. B. F.

Book Reviews.

Phillips (Llewellyn Powell), [M.A., M.D., B.C. (Cantab.), F.R.C.P. (Lond.), F.R.C.S. (England)]. **Amoebiasis and the Dysenteries.**—xi + 147 pp. 1915. London: H. K. Lewis. [Price 6*s*. 6*d*. net.]

The author begins by giving due credit to many workers who have elucidated the various problems of the dysenteries during late years. He tells us that emetin has no effect at all on the encysted form of *Entamoeba histolytica,* which seems rather too sweeping an assertion, for other observers find that cysts disappear from human faeces after prolonged treatment of the patient with intramuscular injections of emetin, though some cases may require a supplementary treatment with small doses of ipecacuanha orally. But in another chapter we are told that emetin is probably more efficient in amoebiasis than quinine is in malaria.

We are reminded that latent symptoms of appendicitis, occurring after amoebic dysentery, should have the benefit of a course of emetin before the case is handed over to the surgeon for operation, but the author still recognizes that surgical interference, appendicostomy or caecostomy, may be necessary in some bad cases of amoebic dysentery. In an excellent chapter upon treatment he recommends that emetin should be injected into the muscles of the forearm in half grain doses night and morning for ten days and then again in interrupted courses of a week for several weeks. When ipecacuanha has to be given instead of emetin, he gives ten grains of tannin with thirty grains of ipecacuanha to prevent vomiting and finds that opium is not then necessary. For liver abscess, he is of opinion that the best operation is simple aspiration, followed by emetin intra-muscularly, but not by injections of quinine into the abscess cavity. Balantidia may be expelled by thymol in large doses, while some cases of flagellate dysentery will yield to the treatment recommended for amoebic dysentery.

A very good chapter is provided on bilharzial disease of the intestines, which so often requires laparotomy or removal of polypoid growths in the neighbourhood of the sphincter. In the next edition of this useful little book, the author will have an opportunity of discarding the German name of the disease—bilharziosis—for the English bilharziasis. Polyvalent serum injections, 20 cc. for adult or child, 10 cc. for an infant, are warmly praised for bacillary dysentery, and the author has seen apparently moribund children recover under its use. He praises the serum issued by the Lister Institute, and also that used in larger doses at the Quarantine Camp at El Tor.

The book contains an adequate bibliography, but the author begins and ends by gratefully acknowledging the help which we all find from the Bulletins issued by the Tropical Diseases Bureau.

F. M. Sandwith.

Stitt (E. R.), [A.B., Ph.G., M.D.]. **The Diagnostics and Treatment of Tropical Diseases.** xi + 421 pp. With 86 illustrations. 1915. London: H. K. Lewis. [Price 8*s*. net.]

This handy manual, a companion volume to the author's well-known "Practical Bacteriology, Blood Work and Animal Parasitology," will be heartily welcomed. It is a distinct addition to the literature of tropical diseases. In 413 pages the author has contrived to condense a very large amount of information, a considerable portion of which is hardly contained in volumes of much larger dimensions. The very latest information on the subject is included; for instance, there is quite a full account of Strong's work on Oroya fever. The first part of the book deals with a description of tropical diseases and their treatment; the second with the

various methods of diagnosis employed, such as blood and stool examination. The pages are interspersed with numerous charts and tables which students of tropical medicine will find very useful. Thus on p. 116 there is a full and practical table of the reactions of bacilli of tropical interest. The more important diseases—malaria, blackwater fever, trypanosomiasis etc.—are treated in considerable detail. Indeed it is difficult to criticise the book. There are no discrepancies and the information is singularly accurate. The reviewer has been able to find but one mistake and that obviously a printer's error in the spelling of LAVERAN on p. 72. The small outline illustrations of fleas, flies and helminths are in some cases a trifle crude, but are in the main accurate.

P. H. Bahr.

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Mr. J. E. Barnard (Lecturer in Microscopy at King's College), reviewing this book in "Knowledge," says: "It may with confidence be recommended as a safe guide for those entering on any field of work that involves the use of the microscope."

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